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A SYMPOSIUM ON TUBERCULOSIS*

THE EVOLUTION OF TUBERCULOSIS IN THE HUMAN LUNG

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The complete evolution of tuberculosis in the lungs in characterized by two broad and separate phases of development to which the terms "primary phase" and "post-primary or reinfection phase" are being applied. Each of these developmental stages of the disease displays a special series of inter-related phenomena which usually make their appearance in a very orderly and stereotyped sequence. Fortunately important orienting information relative to many of these changes can be obtained with comparative ease through serial studies on living patients.

Clinical and experimental studies have shown that an interval of from three to eight or more weeks elapses following an initial infection before evidences of the disease become manifest. During this brief asymptomatic invasion period the migrating tubercle bacilli focalize at multiple points and produce a crop of primary tubercles which attain histologic maturity in the course of a few weeks. At the conclusion of this incubation period the patient develops a transitory fever and becomes sensitive to tuberculin. In most instances no subjective symptoms are noticed which enable the patient to identify the time these changes occurred. Obviously, therefore, the simplest and most reliable means we have for determining the approximate date a primary infection takes place in man is through reapplying tuberculin tests at short intervals to persons whose initial reaction to tuberculo-protein was negative.

As a rule x-ray examinations of recently infected patients are entirely negative and often remain so throughout the remainder of the life of the patient. Occasionally evidence of calcium deposits may appear on chest films and thus the locations of some of the primary lesions eventually become apparent. Often, however, the positive reaction to tuberculin constitutes the only demonstrable evidence the patient has tuberculosis in its primary phase of development. In this large group of cases the primary lesions escape visualization owing either to their small size or to their being obscured by other intrathoracic opacities.

The development of roentgenographically demonstrable infiltrations occasionally accompanies the initial infection with tubercle bacilli. Under these circumstances serial x-ray studies contribute valuable information relative to the changes that occur in primary tuberculosis lesions in the course of time.

Ordinarily, the shadows cast by these infiltrations, which represent primary tuberculosis in one of the early stages of its development, remain practically unchanged in extent and appearance for several months. Finally, however, they begin to resolve slowly and eventually this reparative process results either in the complete disappearance of the lesion or in its reduction to fibrosed or calcified deposits. The changes these infiltrations display on a large scale doubtlessly duplicate those which occur typically in smaller primary lesions situated either in the lungs or in the regionally re-

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lated lymph nodes. Apparently these gross reparative changes extend throughout a period of about two years.

During the months the primary lesions are resolving the patient's disease usually causes remarkably few signs and symptoms that reveal its presence. After the reparative process has reduced the primary foci of disease to fibrosed and calcified deposits the primary phase of tuberculosis enters its protracted latent stage of development throughout which the lesions show no appreciable gross changes and the patients remain asymptomatic but retain their sensitivity to tuberculin for a long period of time. If this were the end of the story of tuberculosis the disease would be of little or no consequence. Unfortunately it has its second stage of development.

Ordinarily the reinfection or post-primary phase of tuberculosis does not make its appearance until the antecedent primary phase of the disease has reached and remained in its latent fibrotic or calcified stage of development. When this complication materializes the early reinfection lesions usually have the appearance of small infiltrations which show a predilection for the upper portions of the lungs. Some of these new foci of disease may resolve either temporarily or permanently. More often, however, they remain essentially unchanged for weeks and months and then begin to enlarge. This change is commonly accompanied by the development of cavities and by the appearance of symptoms of increasing severity. In this manner the post-primary or reinfection phase of tuberculosis passes through its minimal, moderately advanced and advanced stages to culminate frequently in the death of the patient. These progressive changes contrast with the phenomena of repair displayed with remarkable consistency by primary tuberculosis.

On recapitulation it seems to be apparent, that instead of bursting suddenly into flame, tuberculosis ordinarily passes rather leisurely through two successive stages of development as its evolution unfurls. The incubation or pre-allergic stage of the disease, the brief interval occupied by the development of sensitivity to tuberculin, and the relatively long asymptomatic period during which primary lesions are being reduced to fibrosed or calcified deposits are successive changes which combine to make the primary phase of tuberculosis one of many months' duration. Nevertheless the phenomena that characterize primary tuberculosis are rarely witnessed in spite of the additional fact the disease is passing through its primary stages of development in numerous persons throughout all parts of the world where tuberculosis exists. Apparently the usual failure of primary tuberculosis to cause appreciable symptoms explains the common failure to detect a disease whose prevalence almost equals that of chickenpox and measles.

After making their initial appearance the incipient lesions of reinfection pulmonary tuberculosis usually show little or no growth over a period of weeks and months, but in spite of this common tendency toward leisurely development, chronic pulmonary tuberculosis has often progressed to its advanced stage of development before it is diagnosed. Consequently fully three fourths of the victims of tuberculosis fail to receive the benefits of therapy until after they have lost their best chance to recover from the disease. This situation probably results chiefly from the fact that minimal reinfection tuberculosis causes few or no typical and conspicuous symptoms which facilitate its detection. Owing to these special conditions, therefore, periodic re-examinations including repeated x-ray studies on asymptomatic patients are necessary for the consistent diagnosis of incipient tuberculosis. These requirements create a demand for a comprehensive and early diagnosis program which provides for the prolific use of effective diagnostic procedures whose coat is not prohibitive.

In response to this need, perhaps the Orleans Parish Medical Society will be willing to launch its own antituberculosis program and thus demonstrate that the diagnosis and treatment of tuberculosis does not require further socialization of this special field of medical practice. With this

possibility in view, I am taking the privilege of submitting the following program for consideration and recommend that it be referred to the members for a final vote after it has been revised and perfected by the Tuberculosis Committee of the Society. The tentative program I am presenting at this time contains the following provisions:

1. The members of the society will apply tuberculin tests routinely to all of their private patients. In order to facilitate testing the Tuberculosis Committee of New Orleans, which derives its support from the sale of the Christmas seal, has agreed to deliver diluted tuberculin to doctors' offices. This semi-monthly service will be free to the profession.

2. I suggest that the Parish Medical Society purchase and operate 35 millimeter photofluorographic unit and make this step in the examination of private patients available to all members of the society. Also compensate member roentgenologists for interpreting these films. With this unit several hundred examinations can be made daily, and owing to the low cost of 1.5 cents per exposure, the 35 millimeter photofluorographic examination provides an inexpensive method for screening thousands of patients annually. This aid in detecting pulmonary lesions is superior to stethoscopic examination but is inferior to standard x-ray studies. Consequently the third provision incorporated in this program is of great importance.

3. Physicians will obtain standard x-ray studies on all patients whose minature films reveal abnormalities and will also undertake other appropriate examinations needed for diagnosis. Incidentally, these procedures will increase the private practice not only of roentgenologist but also of other physicians.

4. In order to support this program a nominal charge of fifty cents or one dollar can be made for each photofluorographic examination. With each member of this society referring only two patients per week for chest pictures a minimum charge of fifty cents per examination will produce an annual fund of more than $30,000. This fund should make the program self supporting and also provide a balance which the Society could use to finance other health programs.

CONCLUSION

I recommend that the physicians of New Orleans provide their private patients with the same inexpensive diagnostic service the indigent in our community are receiving. If carried out thoroughly this program will increase the frequency with which tuberculosis is detected before it has become hopelessly advanced. Early diagnosis will greatly increase the cases that are suitable for pneumothorax, and this accomplishment will materially reduce the need for sanatorium beds. Incidentally promotion of the early diagnosis program I have suggested probably will tend to close one door through which the socialization of medicine may spread in the near future if we neglect our opportunity and duty. Apparently an enviable opportunity exists for the Orleans Parish Medical Society to enjoy the distinction and honor of being a pioneer in devising an economical anti-tuberculosis program which can serve as a model for other medical societies to adopt and promote.

DISCUSSION

Dr. Sydney Jacobs (New Orleans): Dr. Stewart has very challengingly laid before us a program whereby this Society can engage in pioneering efforts for building up an early diagnosis campaign. Unqestionably, as Dr. Stewart pointed out, there are going to be many objections to this plan. People will see only the formidable obstacles and will not see that the ultimate goal is worth working for. I have not spoken with Dr. Stewart about it so I do not know how much in detail he has worked it out. This much I do know: It is a plan worthwhile for the Society to consider so the private practitioner may be encouraged to look for tuberculosis among his own patients. Many practitioners, unfortunately, do not look among their clientele for early cases of tuberculosis. Many practitioners still believe tuberculosis exists only when there are symptoms of far advanced disease. It is still a sad commentary to realize even today when x-ray is so abundantly used and laboratory facilities over used, that many patients have tuberculosis and escape detection until the far advanced stage is reached.

Dr. Stewart pointed out two other things. One is that the proper interpretation of the tuberculin test, is an excellent aid in arriving at a diagnosis of tuberculous disease.

The other is that tuberculosis ought to be diagnosed when it can be discovered by roentgenologic methods and not by hearing rales.

Once again I wish to commend Dr. Stewart for his excellent presentation and hope the Society will not take his challenge lightly.

Dr. Julius Lane Wilson (New Orleans): We are very fortunate to have Dr. Stewart here to talk to us on this subject as he is one of the men in this country who has done most to work out some of the facts presented, particularly about primary tuberculosis and its ultimate course in the reinfection phase. It is interesting that twenty or twenty-five years ago we thought of tuberculosis as a problem that had to be met in childhood and treated by preventoria and other methods to protect these children from breaking down when adults. The pediatrician has taught us a great deal and quite properly Dr. Stewart is the man to present these facts.

We realize, especially since we have examined so many million young men by x-ray and watched so many thousands of boys and girls grow up under observation, that tuberculosis in the potentially fatal form is a problem of adults, particularly young adults. We can not prevent tuberculosis and eradicate it by merely caring for and protecting children although that is important. There have appeared in the past few years new tools and methods by which we can for the first time approach or even realize our aim of many years to make the diagnosis of tuberculosis early. We have new implements,—primarly the tuberculin test and x-ray brought down to the reach of thousands and millions of people,—and we have for the first time the possibility of controlling the disease.

There is no question, as Dr. Stewart said, concerning the new law in Australia, that everyone will be x-rayed for tuberculosis. That is the challenge Dr. Stewart puts before the Society. Of over a half million people in New Orleans, perhaps four hundred thousand will be taken care of by Charity Hospital, the City Department of Health, and State Department of Health in x-ray examination and case finding. How about the other one hundred and fifty thousand? It is true that they can perhaps obtain x-rays and tuberculin tests and the diagnostic facilities necessary to make a diagnosis but will they? Can they obtain it by going to the State Department of Health or the City Department of Health, or will they have it done through a law enforced to have this diagnosis made? Will that be to the benefit of the patient and the benefit of the medical profession? That is the challenge that Dr. Stewart has thrown out to us as I see it. I think the medical profession in this country certainly needs such challenges as this. We must think out ways by which we can meet the problems of changing medical practice. There is no question it is changing, evolving, and the medical profession needs leadership and guidance in meeting these problems. I wish to thank Dr. Stewart for offering this suggestion as something concrete that we can do.

Dr. Chester A. Stewart (In closing): I have nothing to add.

THIRTY-FIVE MILLIMETER FLUOROGRAPHY IN MASS CHEST X-RAY SURVEYS

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"Finding people with tuberculosis is the primary responsibility of all agencies engaged in ridding the human race of this devastating disease. Any method making it possible for more people to have shadows of their lungs made by x-ray registered permanently on photographic film helps to meet this responsibility and is worthy of serious consideration. When a method appears that decreases markedly the expense of such registration with no great loss in diagnostic efficiency progress has been made. Floroscopic roentgenography (flurography) is such a method."[1]

Fluorography is the procedure of photographing with a camera the image cast by x-rays on a fluoroscopic screen. The principle is as old as x-ray itself (1895) but only within recent years have developments and improvements in fluoroscopic screens, film emulsions, and lense systems made this photographic technic practical.

Although numerous workers have experimented with fluorography through the years, De Abreu[2] of Brazil is credited with doing the first chest survey work with 35 mm. fluorographs in 1936.

In the past three years fluorography has really grown up, with its acceptance by the Army, the Navy, the United States Public Health Service, state and local health departments and industry. Selective Service alone will have taken some 14,000,000 chest x-rays (mostly fluorographs) in processing men and women for military service. War industrial plants have taken added millions of chest fluorographs through employee

†From the Tuberculosis Control Section, Louisiana State Department of Health.

surveys or as part of a pre-employment examination.

Having had the pleasure of working with Dr. W. Palmer Dearing (U. S. P. H. S.) in doing some of the first 35 mm. fluorography in this country in 1938, I can assure you that fluorography has come a long way.

Special chemical coating of the lense system admitting about 20 per cent more light; improved clear base fluorographic film; use of a screen grid; development of a remote control, motor driven camera and just recently a photo timer have revolutionized the work.

Two fluorographic technics are generally employed, one taking single 4″ x 5″ films, the other 35 mm. films in rolls. (A 45 mm. film has been tried and will undoubtedly be the compromise film after the war when equipment conversions are possible since it meets the objection raised to too much reduction in film size while retaining the *roll film* features.)

At this point it should be stated that some radiologists are hypercritical of chest fluorography. They argue that the marked reduction in film size with its attendant loss of detail creates too great an interpretative error. Commander Paul V. Greedy,[3] M D., U. S. N., reporting on the Navy's use of 35 mm chest fluorography, answer the query, "How small a lesion have you been able to detect," thus:

"Single lesions of soft quality which appear to be one quarter inch or less in diameter in the 14″ x 17″ film are detected by our medical officers with photographic experience. Calcified lesions of the apparent size of one eighth inch or smaller in the standard size film are readily seen. Accentuated broncho-vascular markings can be followed well out toward the periphery. We do not claim, however, that all small lesions are always discovered. The position of the lesion and the quality of the film are important factors in our successes and failures."

Fluorographs should be considered an adjunct to big film work and not a substitute. It is still necessary to re-take all suspicious and positive fluorographs on a large film. Detailed comparative readings on known positive chests are not to be attempted on fluorographs.

The war time scarcity of fluorographic equipment has kept this work largely in the hands of official agencies employing well trained phthisiologists and radiologists. Two of these agencies, the Navy and the U. S. P. H. S., maintain research divisions for constantly improving 35 mm. work, and all can afford to add each improvement as it is made available. Technical and interpretive errors of fluorography have thus been kept at a level probably lower than that for average conventional film.

Many critics of fluorography completely ignore the fact that in the final analysis the quicker we can approach universal periodic chest x-rays the quicker we will lay the foundation for the eradication of pulmonary tuberculosis. The dictum for public health, "the greatest good for the greatest number" argues for fluorography.

Early diagnosis of pulmonary tuberculosis and proper classification for its modern treatment require chest x-rays. These were not generally available, particularly in our rural Southern states. To meet the need, Virginia established one of the first state supported travelling x-ray units about 1930. By the time the Louisiana State Board of Health entered this field (1937) thirty-eight states were operating travelling chest clinics.

Operating through the local health units, chest x-rays were made on properly referred chest suspects and tuberculosis contacts who reacted positively to the Mantoux tuberculin test. The tuberculin testing was done well in advance of the x-ray clinic visit and was done primarily to screen the cases to conserve on our x-ray work.

Full medical histories were taken, conventional films were made and later developed in the central office. Reporting was in triplicate; one copy remaining in our central file, one kept in the health unit file and the third copy going to the referring physician. A return visit was made by the clinician to examine the positive cases for a check on activity and to consult

with the attending physicians. Approximately 4,500 chest x-rays were made annually utilizing the one trailer mounted x-ray unit manned by two nurses.

In 1941 the State of Louisiana purchased a 35 mm. fluorographic unit and greatly expanded the tuberculosis case finding program. The approach is still through health units, but survey methods are generally employed. Records now consist of a very simple identification form with a coded system of reporting the x-ray findings. All possible chest x-ray diagnoses are listed in columns for easy checking. A very brief description is made of pathology. With a built-in two carbon record the clerical work is kept at a minimum.

Tuberculin testing as a screening process is no longer employed because it is simpler and actually cheaper to make a fluorograph than to do a tuberculin test. In addition to all tuberculosis suspects and contacts referred in by private physicians, those already attending another health unit clinic, that is, maternity, venereal disease, are invited to have their chests x-rays. Upon request from the medical director of industries, surveys are made available to industry. Those in the state eleemosynary institutions are studied periodically.

All positive industrial findings are sent by the industrial physician to the local physicians.

Clinics are arranged in adjourning or near-by parishes several weeks in advance. The health unit director is responsible for arranging the clinic groups. Since several hundred patients can be easily x-rayed in a single day and since a steady stream of patients can flow through the large metropolitan bus from the front door past the fluorograph and out the back door, it is usually best to have the clinic held in a large public building to have ample waiting room space, proper heat and space to be used for dressing rooms. The records are made out by typists. The patients strip to the waist and don capes. Paper capes are being used in many places since the cost of laundering the capes is more than the cost of the fluorograph (about 3 cents) whereas the paper cape costs about 1.5 cent each. Stepping into the bus the patient presents his record and has his x-ray number assigned. The names are recorded in a summary book alongside the film number. The fluorograph is made and the patient returns to the dressing room. In this manner we have taken up to 890 films in a single day between 9:00 a. m. and 4:00 p. m. Ordinarily it is difficult to bring in more than 400 patients daily to a health unit clinic.

With so few in the school age group showing positive chest x-ray findings, we have discouraged routine school surveys limiting the school examinations, for the duration at least, to the seniors. Although the educational value might justify the effort, difficulty in replacement of equipment demands that we concentrate on groups most likely to give a good tuberculosis case yield. Whereas the Selective Service rejects about 1.2 per cent with tuberculosis or with chest x-ray findings suspect of tuberculosis, we are finding about 1 per cent of our adult industrial group with reinfection type tuberculosis. We have had a surprisingly low percentage of positive findings in our white colleges and not too high findings in our negro secondary schools.

Operating with three persons in the unit; one recording the names, one measuring the patients, setting the machine and exposing the films and the third positioning the patients, we have with a "ready made group" in our state prison taking films at a rate of eight a minute. Actually we have been able to do only about 40,000 studies a year with problems of patient transportation due to delays in machine repairs and being short handed of personnel in our health units. The cost of 40,000 fluorographic chest studies has not increased much over the previous cost of x-raying 4,500 persons annually with conventional film.

With a motor driven remote control camera we take films in rolls of 375 exposures each, which are developed on a special hangar. After the films are read they can be spliced for filing. By buying our fluorographic film in 100 foot rolls and loading

our own spools the cost of the films is seven eighths of a cent per exposure.

All developing of the films is done in the laboratory built in the bus. Film readings are recorded by the doctor in the central office in the survey books and are later transcribed and typed on the records. When complete, two copies of the records are sent to the local health units, one to be kept and the other to go to the referring physician. Retakes on large films are recommended on all positive and suspicious fluorographs.

In addition to our travelling unit, we have located stationary 35 mm. fluorographic equipment in Alexandria, Baton Rouge, Lake Charles, Monroe and Shreveport. New Orleans, as you know, has its own unit mounted in a trailer. In peace times we can expect to do over 200,000 chest fluorographs a year. Periodic chest x-rays on all persons would enable the finding of all pulmonary tuberculosis. Properly classified, the arrested cases could be observed, the treatable active cases hospitalized for initiation of treatment and the untreatable far advanced cases isolated at home or in less inexpensive state institutions for domiciliary care.

To quote Dr. I. Seth Hirsch,[4] Professor of Radiology, College of Medicine, New York University, "Fluorographic surveys on 35mm. film fill every diagnostic requirement, permitting the determination of the earliest lesions both in the lungs and the lymph nodes. The routine and methods of its application are simple, rapid and practical and the cost is small. The tempo and cost are important considerations in mass surveys."

He concluded his paper with the following two paragraphs.

"With the introduction of fluorography which simplifies and materially reduces the cost of examination it becomes possible to think of x-ray examinations in universal terms.

"Thus the roentgenologist takes his place in the great social movement for human betterment and thus roentgenology enters its third and most important phase as one of the great forces of preventive medicine."

We have indeed come a long way.

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Dr. Julius Lane Wilson (New Orleans): I really did not come prepared to discuss two papers but I can not help but say a word about photofluorographic work. As Dr. Brown pointed out, this has revolutionized mass use of x-ray. It reminds me of a silly story I heard the other night. An elephant saw a mouse for the first time. The elephant looked down at the mouse and said, "What are you, insect or animal?" The mouse looked up and said, "Animal." The elephant looked down and said "You are awful little." The mouse said, "Yes, but I've been sick." Photofluorographic work came in in the position of the sick mouse to the elephant of roentgenology. The mouse is no longer sick, with remarkable improvement and advances in the perfection methods and technics. With the new addition of the photoelectric timer this method becomes a new and distinct departure in roentgenology. It will, I am sure be widely used and there will result an increased use of the fourteen by seventeen films which is an entirely different method.

As I said before, I think we must learn all we can about this method and use it not to replace the standard methods of roentgenology but as, in regard to tuberculosis, a case finding method.

One other point I would like to make is that every one of these surveys uncovers a great many other conditions,—cardiac patients and congenital and acquired pulmonary conditions of other kinds. There will be many benefits not only in regard to tuberculosis being eliminated but also in finding other conditions of which the patient may be entirely unaware.

Dr. E. C. Samuels (New Orleans): Really I have had practically no experience with the 35 mm. film for the examination of tuberculosis but I have been with the Army since the inception of the Armed Forces Induction Station which is now approximately a year and a half and we have been using the 4x5 or 4x10 stereo since the fifteenth of September a year ago. With this form of examination we have been entirely satisfied with our results and I think the standard of the Army which they have set for this type of examination is probably as high as in any of the other health units or probably any other form of mass examinations. We have approximately run—for military reasons I can not give exact figures—well over two hundred thousand examinations on selectees by this method and in one year's time, I think Coloney Swinny will tell you, that the Surgeon General's Department has charged us with approximately three errors

that they have been able to detect, up to the present time. We do not know how many more at a later date we will eventually be charged with. One was a case that developed tuberculosis approximately seven months after his induction and the two others were patients that they said had lesions that should have been detected originally at the time the man was inducted.

We make these examinations routinely on every man who is presented for induction in the armed forces. We are making today approximately three hundred examinations a day. Some days we run below that but it will be approximately that number probably during the twenty-eight days that induction is performed at the station. We are able to present the final results to the selection board within an hour and a half after the patient has had his initial exposure. If there is any question at all about the 4x10 film, a stereo or flat 14x17 film is made and it is perfectly marvelous the correlation between the two. We have been able to detect in the 4x10 film what we have seen in the 14x17 plate or stereo.

In regard to the number of lesions found, we are running approximately two per cent of positive chests in so far as tuberculosis is concerned. From the standpoint of location it is quite interesting. The white males from the congested wards of the large cities are running higher than the white males from the country. The country negro is running much lower than the city negro. Our highest percentage is found in the colored race in the congested areas of our cities; either New Orleans or other cities this station comprises. We have facilities at the station, if we had to do it, to process from five to six hundred selectees a day for this type of examination. We would have no trouble in running a crowd such as that and being able to produce the final results, dry film, by two o'clock in the afternoon with induction starting approximately at nine o'clock. We have recently been running some other work on the side at the station on extremities with the photofluorographic method. Of course this has been done before. I understand Dr. Potter in Chicago is doing practically three-quarters of his bone work now with hte fluorographic method. We have been quite successful in extremities and upper thoracic and cervical spine in those we have attempted in this examination.

The other part of it is the number of lesions we turn up outside of the lung. The number of enlarged aortas, aneurysms of the different sections of the aorta, the very much enlarged hearts with every form of cardiac conditions that you could possibly find in any textbook, we see in this station in the ordinary course of our work.

The cost unquestionably is a little higher than the 35 mm. film but we believe, and the Army definitely believes, that the 4x10 stereo is the method of choice. I think Colonel Swinny will demonstrate that to you in his discussion of this paper. We have no quarrel certainly with the 35 mm. film but we think at the induction stations throughout the country that we can see more with the 4x10 film.

Dr. McClanahan (New Orleans): I have been at the joint Army and Navy induction center since February first of this year. The center was in operation some time prior to that date. I must confess when I first went on duty at the station I was a little skeptical of the 4x5 films. Occasionally a selectee would come to induction and we suspected tuberculosis and the small film was reported negative and I would order a larger film. So far as I know never where we ordered such a 14x17 film was anything found that was not found on the small film. I have had no experience with the 35 mm. film. I helped in a case-finding study in Chicago. We ran in our case-finding study three and two-tenths per cent positive in negroes. In the Lying-In Hospital all white patients, roughly, one per cent were positive. Perhaps the average figures between the negroes and white there was about as here.

One thing I have learned and have convinced myself of in the ten months I have been at the Army-Navy Induction Center is that these films are reliable. No one claims quite the detail of the 14x17 film. For case-finding I am thoroughly convinced it is a reliable method and worthy of adoption for mass studies when undertaken by medical societies over the Country.

Dr. John M. Whitney (New Orleans): I would like to point out that this Society some months ago approved this program of taking pictures by fluorographic methods. I would like to correct the impression that we might be behind the times on that.

Dr. R. Alec Brown (In Closing): I hardly expected to present a comparative study of 35 mm. and 4″x5″ technics, otherwise I would have given more figures regarding the technics and errors of the two. Such studies have been made. In 1940 the U. S. Navy approved 35 mm. work. This was the first official acceptance of the techniques in this country. We were delighted that both the Army and the Navy adopted fluorographs for their chest X-ray survey work. The Army desiring to keep the individual fluorograph with the individual's Army medical record so that a discharge film could be compared with the induction film; naturally chose the 4″x5″ film.

Those of us in public health work examining thousands of people, find the 35 mm. roll film far more practical and more economical.

As brought out by Dr. Wilson cardiac, aortic and other chest pathological findings add a strong argument for the use of inexpensive routine chest fluorographs as part of every general physical examination.

Stereoscopic films are desirable but the added cost of materials and wear on equipment does not

justify our using this method routinely as the Army does.

It is interesting to note in passing that 35 mm. fluorographs are well enough accepted that they are now being used by industry in X-raying the aluminum castings used in our bombers and fighter planes. The unit for doing this work was made available for the first time this month.

THE PERMANENT PRESENCE OF SPECIFIC IMMUNIZING ANTIBODIES IN THE BLOOD OF YELLOW FEVER SUBJECTS

EXPERIMENTALLY DEMONSTRATED BY THE "MOUSE PROTECTION TEST", SEVENTY-SEVEN YEARS AFTER A CLINICALLY RECOGNIZED ATTACK OF THE DISEASE*

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In a preceding article, I described my personal experience with yellow fever—an experience which was unusual in many ways, but especially because it seemed to challenge the old, well-founded and generally accepted belief that one attack of yellow fever conferred permanent immunity against all future attacks.

As previously related, and contrary to all precedent, I had to my credit, or discredit, the record of four distinct attacks of a fever (contracted in the course of as many typical and historic epidemics) which competent experts had diagnosed as yellow fever.

Merely to recall the essential facts of the previous discussion, I will state that the first attack occurred in my childhood, when seven years old, during the malignant epidemic of yellow fever which swept over New Orleans and the Gulf states in 1867, leaving 3,100 dead victims in its path. In this, as in subsequent attacks, I was attended by an able and experienced practitioner who declared that my fever was of the severe but uncomplicated epidemic type of the then prevailing yellow fever. This opinion was shared by my parents, who hailed my recovery with great satisfaction as it conferred upon me the title of "immune," which was of such inestimable value to its possessor, and especially to doctors, whose usefulness in all yellow fever countries depended largely upon this qualification.

The succeeding three attacks were connected with dramatic episodes which seemed to contradict the belief in my immunity, as established by my early experience in the epidemic of 1867. For it was while serving as an undergraduate intern at the Charity Hospital of New Orleans during the devastating epidemic of 1878; later as laboratory assistant to the first yellow fever commission sent by the United States Government to Havana in 1879; and, again in 1882, as relief physician at Brownsville, Texas, in the widespread epidemic that prevailed that year in the Rio Grande Valley—that I contracted in each instance, a mild type of fever which my attending physician labelled as "mild abortive" or "attenuated" attacks of yellow fever of the mild type prevailing in the epidemics at that time. It is notable that I recovered promptly without complications from all these attacks. In this way, my immunity to yellow fever had been seemingly quadrupled within a period of fifteen youthful years.

I again came in frequent contact with yellow fever in New Orleans and neighboring towns in the course of 23 years that stretched from the epidemic of 1882 on the Rio Grande, to the last and epochal anti-mosquito campaign in New Orleans of 1905, which ended in the complete extinction of the yellow plague in New Orleans and in the whole North American continent. During that period and since, I have had no reason to fear a break in the continuity of my immunity which, despite my great respect for the opinion of the distinguished colleagues and friends (who believed that I had been attacked by yellow fever no less than four different times) I have always felt a deep conviction that it was the first attack in my early childhood during the epidemic of 1867—77 years ago—which was the primitive and real yellow fever in-

*A supplementary note to a paper on "Personal Experience and Reflections on Yellow Fever" published in the New Orleans M. & S. J., 96:10, 1943.

fection; the attack that stamped on me the signature which subsequently carried me safely through the other abortive or simulated yellow fever attacks.

During the nearly four decades that have followed the great sanitary victory of 1905 in New Orleans, Yellow Jack has given no sign of resurgence, and the horrors of his rule have been so completely submerged under the great wave of prosperity that followed his extinction, that the present generation knows the evil story of the "Yellow Ogre of the Tropics" only as a legendary tradition.

It is only since the prodigious development of aerial ways of communication and transportation with the newly recognized widespread foci of infection in the jungle areas of South America and Africa, that memories of the old yellow fever visitations are being revived as the sanitary authorities are becoming quite alert to the dangers of possible importation and recurrence of the deadly pestilence in its old familiar Southern haunts.

The discoveries and advances that have followed in the wake of the great yellow fever investigators and explorers of the Rockefeller Foundation in South America and Africa in the last two decades have so profoundly affected and changed the previous concepts of the disease, that the early pioneers of the beginning of the century—Finlay, Reed and Gorgas—whose genius opened and blazed the way to the present advances, would scarcely recognize the old picture of yellow fever in its new dress and strange physiognomy.

The story of the jungle type of yellow fever, of its vast and unsuspected Brazilian and African habitats, of its new animal carriers and insect vectors, and of the new methods of detecting the presence or absence of the yellow fever virus in suspected individuals and communities, of the methods of definitely determining the diagnosis of active, present or past, yellow fever infections, and the discovery of an infallible test of its presence in the liver tissues after death; and the still greater discovery of a safe and practical vaccine for the protection of the individuals exposed to the infection—have all been sufficiently stressed in my previous communication and in the vast literature that is steadily accumulating on this vital subject; more especially since the prophylactic needs of our expeditionary forces in tropical regions have added a new spur to research in this direction.

* * * * *

My present purpose is chiefly to avail myself of the unusual opportunity offered by my own, rather unique, personal experience, to determine the fact that an individual is or has been the subject of the yellow fever infection, and to determine the immunity conferred by such an infection, as well as its resistence and duration after an attack. Having been praised for surviving four attacks of yellow fever, it would have been interesting to determine which one, or if all four attacks were yellow fever; but an answer to such an inquiry could only have been possible at the time when the attacks occurred. However, the fact that the first well authenticated attack had occurred in my childhood, 77 years ago, and the last of the alleged attacks 65 years ago, made me curious to know if my blood retained any immunizing properties, despite the unusually long period of time that intervened between the original infection and the test.

In this connection I was also interested in knowing if there was: (1) any clear relation between the titer of the antibodies in the serum and their protective value; (2) if age had any deteriorating effect on the protecting value of the antibodies?

Very fortunately, a ready and highly authorized reply to these questions was obtained through the courtesy of Dr. Simon Flexner (Emeritus Director of the Rockefeller Institute), Dr. J. Bauer (Director of Laboratories) and Dr. Max Theiler (associate) in the International Health Division of the Rockefeller Institute for Medical Research of New York, to whom I individually and collectively wish to express my thanks and grateful appreciation. I am particularly obliged to Bauer, for his valuable discussion of the subject in the letters here-

with appended, and to Theiler for his detailed description of the "mouse protection test," which he applied to the specimen of my serum which was mailed to the Rockefeller laboratories with all the necessary precautions, through the courtesy of Dr. Edwin H. Lawson, of the Laboratory of Clinical Medicine of Tulane University. Though the "mouse protection test," which Theiler was the first to devise and apply by the intracerebral method, has been described in many publications and the *Index Medicus* is crowded with references to its application by yellow fever workers all over the world, a clear, concise description of the technic adopted by Theiler will be appreciated by all those interested in the outcome of this notable experiment.

As the opinions of Bauer and Theiler are strictly pertinent to this discussion, I will quote them in the original text of their letters to me.

Dr. Bauer, on June 29, 1943, wrote: "I have read with a great deal of interest the proof of your paper in the New Orleans Medical and Surgical Journal, in which you describe your experience during the four attacks of yellow fever. If you will arrange to send us about 5 c.c. of your serum taken aseptically, we shall be very glad to do a yellow fever protection test on this specimen with a view to determining whether or not you have yellow fever immune substances in your serum.

"If the test is positive, it will not allow us to determine which of the four illnesses was yellow fever. We do not believe that all four attacks, which were diagnosed by the attending physicians as yellow fever, actually were this infection, as such an occurrence would not be in accord with present-day knowledge of yellow fever. As you well know, there are many statements in the literature to the effect that one attack confers lifelong immunity. It is impossible to state whether this is true. We do not know of a single case where a proven second attack followed an original one, regardless of the time interval. In the laboratory it is impossible to reinfect an immune man or monkey regardless of the amount of highly virulent material given.

"There is a tendency during an epidemic of yellow fever to diagnose any febrile illness, most often malaria, as yellow fever, chiefly because there is nothing characteristic about a mild attack of yellow fever to aid in diagnosis. Bleeding gums and so-called black vomit are usually absent in malaria as well as in yellow fever. Newer methods, such as searching for malarial parasites under a microscope or the finding of albumen in the urine, which is the most diagnostic sign of yellow fever, along with leukopenia, were not in common practice when your attacks occurred in 1867, 1878, 1879 and 1882.

"I am willing to share your belief that if you had yellow fever, your attack must have occurred in 1867, and the subsequent attacks, each of which you remember more clearly, must have been something else. At any rate, if you will be kind enough to send us a sample of your serum, we shall be very happy to determine whether or not you are, at present, immune to yellow fever." (Signed) J. H. Bauer, M. D., Director of Laboratories.

On August 30, 1943, Dr. Max Theiler wrote as follows: "The method used for testing your serum for antibodies against yellow fever was the *intracerebral mouse protection test.* (Theiler, M., Ann. Trop. Med. & Parasit., ,27:57, 1933; Baugher, J. C. Am. J. Trop. Med., 20:809, 1940.) In brief, the test consists of mixing the serum to be tested with yellow fever virus of the French neurotropic strain. The dilution of virus added to the serum is standardized so that mice inoculated intracerebrally with 0.30 c.c. receive approximately 100 M. L. D. (minimum lethal dose). As a rule six mice are inoculated. If all or all but one of the mice live, the result is interpreted as protection. If, on the other hand, all the mice die, the serum is considered negative.

"In the test in which your serum was tested titration of the virus used showed that each mouse inoculated with a serum-virus mixture received 50 M. L. D. Of 12 mice inoculated with the mixture contain-

ing your serum 11 lived, whereas none of the 12 mice lived which were inoculated with a mixture of the virus and a known normal human serum. In a similar manner 11 of 12 mice lived which were inoculated with a mixture containing the virus and a known yellow fever immune serum.

"I would like to emphasize that the intracerebral protection test is used only by a few workers. The standard test in extensive use for several years is that known as the *intraperitoneal protection test.* (Sawyer, W. A., and Lloyd, W., J. Exp. Med., 54:533, 1931.)

"It is my opinion that the titer of an immune serum as measured by the protection test in mice gives a good indication of the 'protective' value as tested in monkeys; that is, the higher the titer, the less serum is necessary to protect a monkey against an experimental infection.

"As to your question whether age has any deteriorating effect on the titer, no very extensive observations are available. However, it is my opinion that individuals who have had yellow fever many years ago are not as likely to have as high a titer, as those who have had an attack recently." (Signed) Max Theiler, M. D.

* * * * *

Since the above was written, my attention has been directed by Bauer to an experimental study on the "Persistence of Yellow Fever Immunity" by Wilbur A. Sawyer, the present Director of the International Health Division of the Rockefeller Foundation (J. Preventive M., Nov. 1931, 413-418). The conclusions of this fundamental report, published nearly 14 years ago, are based on the experimental test, in monkeys, of the protecting value of the blood serums of sixty persons who gave a history of yellow fever attacks varying from 30 to 78 years before the test was applied. The test applied by Sawyer differed from the "mouse protection test" in the fact that Rhesus monkeys were used instead of mice. Max Theiler's capital discovery in 1929 of the great sensitiveness of white mice to the yellow fever virus and his intracerebral injections had not been made generally available. Sawyer revised and gave references to various publications on the duration of the immunity conferred by yellow fever that had appeared in the literature of tropical diseases before his own investigations had appeared. These observations showed the protective influence of human serum from individuals who had been diagnosed as having had yellow fever from 20 to 30 years before the protection test on monkeys was applied, but none after such long intervals as those reported in Sawyer's later tables. These tables included the record of 60 observations of individuals whose sera had been tested by Sawyer's monkey protection test, with the result that in 45 individuals, or 75 per cent, the animals were protected and survived the inoculation of lethal doses of the virus. The time interval between the date of the primary yellow fever infection and the protection test varied from 30 to 78 years with 57 years as the midpoint between the extremes:

Sawyer's test consisted in injecting a variable amount of the human immunizing serum (1-5 c. c. to a kilogram of body weight) into the peritoneal cavity of a Rhesus monkey. From four to six hours later, the monkey was given a subcutaneous injection of the yellow fever virus of a known virulent strain (Asibi) in fresh defibrinated blood taken from an infected monkey on the first day of the fever. The volume of infected blood injected varied from .25 c. c. to .4 c. c. The monkeys were kept under observation for thirty days and the rectal temperature taken twice daily. For every group of tests there was at least one controlled monkey that received an amount of human normal serum equal to the largest dose of serum used in the corresponding test. The controlled monkeys were given the same amount of virus as the test animals, with the result that all the controlled animals died of yellow fever with one exception, from four to eight and a half days after the inoculation. The monkeys protected by the immunizing serum survived though not always without showing, in many, marked febrile reactions.

Most pertinent to the present inquiry is the fact that five out of six serums from persons who have had yellow fever *75 years* before the specimens were obtained, protected the monkeys and saved them, as did also one specimen taken *78 years* after the yellow fever attack!

This is the case of a colored woman of Thibodeaux, La., who contracted yellow fever when a baby six months old, her mother having the disease at the same time. This happened at the time of the great epidemic of 1853, the most deadly in the history of Louisiana and perhaps of the North American continent (7,849 deaths in a population of 151,132 in New Orleans alone, and 100 deaths in Thibodeaux, a town of scarcely 2,000 inhabitants at that time). It was reported that this patient was alive and active in 1931, at the time of Sawyer's report. The blood serum from this subject was given special attention and tested in monkeys and later in mice. It was found that this woman's serum had a protecting effect in saving the animals even in dilutions of 1 in 8 and was still life-saving in 1 in 16 and 1 in 32 dilutions, but not without great febrile reactions and other evidences of weakened but still active immune bodies. Tried on two monkeys, the serum of this woman when injected in amounts of 3 c. c. and 1.5 c. c. per kilogram of the animal's body weight, respectively, saved both animals, but not without high febrile reactions indicative of incomplete or partial immunity; an effect which was avoided by injecting larger doses of protective human serum.

In general, the test of monkeys and mice are consistent. As Bauer observes, "the highly virulent dose of the virus was used in testing the monkeys and the test was therefore much more severe than in the mouse protection test." If the latter test had been used, it is probable that even larger numbers of immunes would have been found in Sawyer's research; but even with Sawyer's very severe test the sera from the persons who had yellow fever 75 to 78 years after the attack, saved the animals inoculated with lethal doses of the virus.

In general terms, the conclusions arrived at in this research, in which the Rhesus monkey was utilized, have been more than confirmed by the "mouse protection test," whether by the intracerebral technic of Theiler, or the intraperitoneal method of Sawyer. Without entering into a discussion of other interesting and debatable phases of the immunology of yellow fever, I may state that the conclusions arrived at by Sawyer in 1931 hold true now as they did then.

CONCLUSION

The belief in a permanent life-long immunity conferred by an attack of yellow fever finds confirmation in all the experimental evidence obtained by the protection tests with monkeys and mice, as illustrated by the author's recent experience which shows that his blood serum is protective and life-saving to mice, 77 years after a primary attack of yellow fever.

The certainty with which the sera of persons convalescent from an attack of yellow fever can be relied to protect monkeys, mice and other susceptible animals, is a fact too well established by experimentation and by the rapidly accumulating evidence of vaccination of armies and whole populations, in mass, to call for discussion.

"While there is evidence suggesting that the concentration of antibodies in the serum may in some cases gradually diminish until they are no longer demonstrable by protective tests with ordinary amounts of the immunizing serum, it does not follow that in such cases the persons become again infectible." (Sawyer).

This observation may imply that revaccinations may become necessary at certain periods to reinforce the immunizing antibodies in the threat of epidemics, or in facing concentration of the virus in jungle warfare. We may trust the experience of the present war waged in yellow fever infected countries to determine the possible need of revaccination. In the meantime, the discovery of the "mouse protection test" remains one of the fundamental and most important acquisitions of Tropical Medicine and modern Sanitary Science. It establishes the presence or absence of yellow fever antibodies in the blood as a definite fact beyond conjecture, and, in this way, eliminates the bitter and unseemly wrangles between experts in attempting to differentiate the mild and atypical cases of yellow fever which were so often insidious precursors of epidemics in the days when clinical evidence was alone available.

MILKER'S NODULE

MARVIN T. GREEN, M. D.
RUSTON

In 1940, Becker of Duluth, Minnesota, reported his study of four cases of milker's nodules, which came under his observation

the previous year, and stated that he had been unable to find in American literature any description, or report, of a case.

He presented a complete study of this disease, which he classified as occupational, and stated that the cause was a virus which may be a modification of the vaccine virus, but more closely resembles the paravaccine of Lipschutz.

Although this is the first description of this disease and the first case reported in American literature, Becker, in his description, stated that he was sure the condition was not rare in this country, and that his calling attention to it would bring forth many cases.

In discussing this same paper, Love, of Boston, stated that, "This condition is relatively unusual," which I interpret as meaning that the condition is rare.

The only other reference in American literature I have been able to find appeared in October, 1941, when in "Queries and Minor Notes," in the Journal of the American Medical Association, a case of a lesion on the hand of a young woman, who spent her summer vacation on a farm, was discussed and a diagnosis asked for. The editor stated that, "This question has been referred to a surgeon and to a dermatologist." Both ventured the opinion that the lesion was possibly milker's nodule, and referred to Becker's article. In the reply, one stated that the condition is so uncommon that possible variations in the clinical picture may not be well recognized.

The object of this paper is not to add further to Becker's complete description of the disease, but simply to dispel the concept of its rarity, especially in this area of the deep South.

As a young practitioner in 1928, I saw my first case of milker's nodule, when a farmer came to me with a typical nodule on the right forefinger, and told me that it was caused from milking a cow. The lesion healed completely in time and left no scar. Since that time, we have seen these lesions and recognized them as occupational lesions many times.

A report of a typical and most recent case follows:

CASE REPORT

M. H., white male, 58 years of age, a school teacher, complained of a "growth" on the right index finger, which he stated began as a small nodule about three weeks ago. This was not sore or painful but had steadily grown larger. At no time had he been ill or had any glands enlarged in the arm. He had been successfullly vaccinated for smallpox fifteen years ago and had been vaccinated several times since, with no reaction.

The lesion was approximately 1 cm. in diameter, purplish, umbilicated, and was tense so that there was a glossy appearance. The margin was well demarcated. There was no soreness on manipulation and the function of the finger was not impaired.

He stated that he milked his cow and had done so for several months. So far as he knew there were no sores on the cow's teats or udder.

The cause of the lesion was explained to him and a simple dressing applied and within two weeks it had healed completely without scar.

All cases of milker's nodules have occurred in milkers of cows and usually a history of sore teats or udder on the cow is obtained. The lesion is usually a single isolated one. I have never seen more than one lesion on a person but according to reports in the literature they may be multiple and generalized.

The nodule is very distinctive and if kept in mind would scarcely offer any differential diagnostic problem. Undoubtedly the infectious agent is a virus. The nature of this virus is questionable. There appear to be at least three concepts in this regard: (1) It is identical with that of vaccinia; (2) it is an attenuated or modified form of vaccinia; (3) it is not related to vaccinia, but is a paravaccinia of Lipschutz.

The histologic picture is not typical, but varies with the stage of development.

TREATMENT

I have found that the best treatment is simply protecting the lesion. It heals completely, without scar.

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PRODUCTION AND TREATMENT OF SCARS AND KELOIDS*

WALLACE MARSHALL, M. D.
MOBILE, ALA.

With the use of a particular fraction of liver extract, which was prepared from liver paste and processed to render it safe for parenteral treatment, Marshall treated 25 unselected cases of acne vulgaris with this material. In this study he found that 89 per cent of these cases showed moderate to marked improvement.[1] These findings were checked by two qualified observers who treated the same types of cases independently. They obtained moderate to marked improvement in 83 per cent of their series, and there were no failures, in that all patients responded to some extent to this technic.

I was able to record three-tenths of a degree reduction of the facial skin temperature in a normal subject who had been given the same experimental material. This temperature change was noted by means of a thermocouple skin thermometer. White, blanched-out skin areas were observed where the temperature drop was recorded. These areas of vasoconstriction were seen in every patient who received the experimental material. Hyperemic, indurated skin areas were shown to be particularly prone to this vasoconstricting action of the material. The reaction of blanching lasted from a few days to nearly a week in various patients.

In another study on the pathogenesis and treatment of keloids, Marshall and Rosenthal[2] showed that keloids could be partially contracted with the use of Marshall's vasoconstricting material which was obtained from liver extract. The blanching of keloids and the adjacent skin took place, even if the keloids themselves were injected directly, and this phenomenon took place, also, when the material was injected parenterally (subcutaneously).

It was found with microscopic studies, that keloids contain a fibrous deposit along with much tissue fluid, so that a localized edema was, at least partly, responsible for the keloidal swelling. With the introduction of localized vasoconstriction, through the use of my experimental extract, the keloids actually were reduced in size. This reduction was actually measured and recorded on photographs.

From this work it appears that the formation of keloids is due to a localized extravasation of tissue fluid into the neoplasm. The partial reduction in the size of these growths shows that at least some of this edema can be released through vasoconstriction. In other words, the phenomenon of the tissue fluid flow into the keloid can be replaced, at least partially, at this time, by the experimental production of a localized vasoconstriction which allows a portion of the pent-up edema to escape from the keloid. This can be ascertained readily, since the keloid will pit upon pressure. This was not observed before the injection.

From studies to date, no signs of an increase of blood pressure have been noted in the many cases which have been observed. Hence, the vasoconstricting factor, which I have isolated from liver extract, seems to exert only a selective vasoconstricting action on the skin arterioles. The contrast between this material and all known vasoconstrictants is obvious, since no generalized action has been observed when this experimental material was employed.

The relationship of vasoconstriction to the matter of wound healing has received some attention lately. Krieg[3] has used low temperatures (ice caps) to surgical wounds for the control of pain. He has reported a reduction both in the complications of anaesthesia and/or operations. Through the use of ice caps Krieg has caused vasoconstriction to occur.

Since the publication of Sano and Smith's[4] work on the study of cold com-

*Presented at the New Orleans meeting (Southern Section) of the American Federation of Clinical Research, December 3, 1943.

*Prepared by Lilly Research Laboratories, Indianapolis, Indiana, through the courtesy of Dr. Teeter, Medical Director.

presses to wounds, I have employed their technic routinely. In another article[5] I discussed this aspect on the subject of wound healing, and found that the decreased blood supply (partial anoxia) produced by cold compresses, seems to enhance wound-healing ability.

Furthermore, the use of a roll of gauze, which is held firmly and directly upon the wound by tension sutures, definitely produces less tendency for the formation of keloids. Accordingly, the compress produces a partial anoxeia through the application of pressure from the over-lying tension sutures. I have had the opportunity of observing this fact for years and have noted that keloids are far less apt to occur when this method is used than when the abdominal dressings are held in place merely through the use of loose adhesive tape. Here again, is the production of vasoconstriction through the employment of pressure dressings.

In still another study, I have observed the healing of burns with the pressure method as advocated by Allen,[6] and in other and in later papers by Koch and his associates at Northwestern University Medical School. In a recent article I[7] have described the use of an ointment* which would not adhere to the burned areas when the above pressure method of Allen, et al. was employed. Even though keloids are common in the negro, I have experienced no keloidal formation in these burn cases which I have treated by this method, and the reason for this result may lie in the knowledge that keloids are more apt to occur if the tissue edema, which is plentiful in burn wounds, is prevented from becoming localized. Once this takes place, the fibroblasts begin to lay down connective tissue, and the keloid begins to develop. Therefore, it has been my rule to compress the wound (burn) tightly in order to prevent the tissue transudate from entering the injured area. Since the skin normally exhibits tissue spaces which can easily become accessible to the edema, pressure on the wound will collapse these areas.

*Modified Allantomide ointment manufactured by the National Drug Company of Philadelphia, Pennsylvania.

Skin grafting involves the same technical points which have been discussed above. Tissue edema is likely to be produced due to the surgical trauma, and the formation of hypertrophic scars and keloids may result from such a routine.

The question arose, just recently, as to whether or not the production of vasoconstriction could at least partially collapse such scars which resulted from plastic surgery, particularly from the use of tissue grafts in an old burn case. A well-developed and otherwise healthy female, aged 35, suffered severe, disfiguring burns of the face in 1930. Multiple skin grafts were made on the burned areas with apparently successful "takes" by a competent surgeon. However, some hypertrophic scars developed. These improved somewhat under my therapy, in that the skin borders appeared to become better integrated and less pronounced. The patient received one half of one cubic centimeter of the vasoconstricting material for twenty doses which were given twice a week. The treatments were terminated in order to determine just how long the improvement would remain. Probably the most severe critics' reaction would be from the patient herself. She stated that the improvement persisted for two weeks. My opinion, and that of others, is that improvement is still present. However, the main point in question has been settled, and that is the chronic tissue edema, which may be present in these old plastic surgery scars, seems to respond in a manner as is noted when keloids and acne scars are treated similarly. However, the older the scar, the slighter the improvement, or tendency for reversibility of tissue edema, which is apt to ensue with the use of this vasoconstricting material. This is borne out by the statement given by this patient who noted that the older skin transplants did not hold their improvement as well as did a skin transplant of two years' duration. This is due, probably, to the fact that more fibrosis (laying down of connective tissue) has taken place in the older transplants. Hence, vasoconstriction is less likely partially to collapse them.

This observation has been noted, also, in the previous study on keloidal growths.[2]

SUMMARY

An experimental liver extract fraction, obtained by me, was given parenterally to patients with acne vulgaris. These patients exhibited multiple scars from the disease. Further studies revealed that improvement was produced by vasoconstricting material derived from liver extract, which exerted its pharmacologic effect on the arterioles of the skin in normal and in scarred patients. Shrinkage in the size of keloids was observed also, because of the escape of the transudate which was present in these neoplasms.

The effect of vasoconstriction in wound healing seems to be rather important, since other vasoconstricting agents, such as the application of cold compresses and also pressure, seem to exert a decidedly beneficial effect. Furthermore, there seems to be less tendency to the formation of keloids under this regime which produces a partial tissue anoxia. The same observations held true in the modified pressure treatment of burns which were studied by Marshall and Greenfield. From the information obtained in the skin grafting of patient who submitted to multiple operations, it was found that younger grafts responded better to vasoconstriction than did the older grafts. Continued pressure on all skin grafts may prevent, at least partially, scar or keloidal formation. Plastic surgeons are invited to observe these suggestions with the hope that this additional information may bring their patients and them superior results.

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FOOD: FACTS AND FADS*

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It may seem somewhat unusual for a pathologist to discuss the subject, Food: Facts and Fads. But, aside from its gastronomical appeal, perhaps most of our interest in food has arisen from the pathologic consequences of nutritional disturbances. For example, without such deficiency diseases as scurvy, beriberi, rickets and pellagra, the vitamins as such would probably not have been discovered; without the metabolic disease, diabetes, with its impairment of sugar metabolism, insulin would not have been found; and without the disease, arteriosclerosis, there would be no urgent need to investigate its relationship to cholesterol or fat metabolism. It is not strange, therefore, that pathologists should be interested in starvation as a worldwide problem because of its pathologic implications with respect to a type of nutritional deficiency characterized by the serious depletion of all of the food constituents which are normally stored in the tissues. Emphasis will be placed in this discussion upon the general problem of undernutrition and its relationship to the war and the postwar world, with particular attention to the following three categories:

1. Facts about food as an immediate American problem.

2. Facts about food as a worldwide problem.

3. Food fads and their relationship to facts.

Aside from its general influence upon

*Read at the Eighth Annual Meeting of The New Orleans Graduate Medical Assembly, March 7, 1944.

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growth, food also acts, according to Mendel, "(a) to avert loss, because of being themselves consumed, the constituents of the diet for the most part avert the necessity for the destruction of body tissues and thus protect the latter from disintegration and (b) to restore what has been destroyed within the organism." In all these processes the proteins, carbohydrates, fats, salts, vitamins and water are mutually utilized. In normal nutrition these processes function harmoniously; when they function otherwise malnutrition or undernutrition result. Today, because of the many wartime dislocations, both malnutrition and undernutrition are vast worldwide problems; in fact, the condition of generalized starvation, with its immense death toll, constitutes perhaps today's outstanding economic and medical problem.

We in America have never had a famine comparable in any way to the famines which are now devastating other lands. Our own food problems thus seem small and almost petty when contrasted with those of war-tired Europe and Asia. Out of our great abundance we must renounce only a few of our many luxuries; instead of a dozen kinds of meat we still have a reasonable choice of fish, of fowl and of some meat, and there is abundant evidence that, as a whole, we are actually better fed now than we have been at any time in recent years. This gratifying fact is due, of course, to our large war wages and the resulting increased purchasing power; indeed, many of our citizens are buying meat, milk, eggs and other good protein foods in larger quantities than they ever did before. Nevertheless many of us are not satisfied with our food situation and wonder what can be done to improve it. We have enough of the energy foods, the fats and carbohydrates, but, despite employment of that ingenious device called the "meat stretcher," whereby larger proportions of oatmeal, wheat flour, soybean flour, are mixed with our sausages and meat loaves, we are still unhappy about its limited elasticity. As the British say, after stretching their meat almost to the snapping point, "We still have but two kinds of bread, bread and sausage." Our approaching meat scarcity arises from the current shortage of high protein and other animal foodstuffs; in fact, there will undoubtedly be a large deficit this year, necessitating a sharp reduction in our livestock population. No one in this country, unless he be a vegetarian or a Hitlerite, relishes the prospect of a decreased meat supply, but no type of meat stretcher can close the gap between the 124 pounds per capita of meat available in 1943 and the 160 or more pounds per capita desired today. To be sure we may soften the unpleasant fact somewhat by disparaging the use of animal protein through resurrection of the old vegetarian argument that it is wasteful to feed foods to animals rather than to consume them directly. It should not be overlooked, however, that in such a trade the animals get the better bargain in that they eat the whole grain, whereas we get mainly the degerminated wheat and corn.

But even if we have to modify some of our former meat-eating habits, famine in America will remain a long way off. Admitting this year's political need for an impending "famine," and admitting also the high nuisance value of rationing, black markets, subsidies, food planning and the like, nevertheless we will probably continue to be the best-fed nation in the world. However, in face of the grim fact that our young folk are fighting both the enemy and loneliness on extended battlelines all over the world, we can surely forget, for a while at least, our steaks and ribroasts.

When we attempt to integrate the American food problem into its worldwide interrelationships, one of the most important questions is: Have we really solved our food problem just by producing food for ourselves and a few favored friends and allies or should we attempt to utilize our great productive potentiality to accumulate food now as an offensive war weapon and later as a humanitarian instrument for healing the ugly wounds of war? For example, the collapse of Italy because of exhaustion of her war materials, including

food reserves, illustrates the inevitable consequences of food scarçity in a warring country. There can be but little doubt that anticipation of forthcoming food supplies played no small part in the breaking of the Italian will to fight. In fact, according to one observer "there was only one aim for the people, to get as much food as possible." Although we now have to feed many of the Italians, that fact may suggest to the hungry millions in the Balkans and elsewhere that they, too, may get food as the Italians already have if, in the words of Churchill, "they are willing to work their passage back." For strategic reasons, therefore, it would seem to be good policy for us to accumulate large food stocks now for use as a weapon of offensive warfare. Perhaps it may be impossible to produce and store large food reserves because of limitations imposed by other prior wartime needs; but certainly we cannot accumulate reserves of food if we continue to eat now most of that which we produce. According to Professor John Black, in his book, "Food Enough", "Not even now have the food planners sensed the full probable impacts of the food shortages facing this country and its allies now and when reoccupation begins." But regardless of what we can or may wish to do about it, of at least one fact about food we can be sure,—relentless hunger exists throughout the world as it probably never has before, and it will continue to dominate the daily lives of millions of miserable people until the last wretched victim of this war has died from his terminal infection.

As the war proceeds, therefore, starvation will gradually loom up as its biggest medical fact, and food will be its only cure. But the fact of terminal infection as starvation's final malady will also afford a clue to the remedy as well, because these deaths result usually from nutritional impairment of the bodily machinery.

The recent reports from India's famine areas of mounting death rates from cholera, malaria, dysentery and other infectious diseases merely re-emphasize the long-known association between famine and infectious disease. This sinister relationship is all too familiar now in all the occupied countries of Europe, where death rates from infectious processes are rising steadily as the destructive forces of war expand while the total food resources shrink.

Among the food constituents utilized for building up resistance against infectious microorganisms, protein plays a dominant part. This does not mean that other dietary elements are not important; but protein metabolism determines the structure of the antibody mechanism, the foundation of the entire structure of acquired immunity; and antibodies can be fabricated only from protein foods. We have discovered in our laboratory that animals fed diets presumably adequate in all dietary elements except protein cannot produce antibodies effectively. These antibodies, so essential for the successful defense against diphtheria, smallpox, tetanus, typhoid fever, scarlet fever and many other microbic infections, are large protein molecules composed of a complicated assortment of amino acids. Unless these dietary amino acids in the form of proteins are eaten in ample quantities and in a wide variety, specific antibodies can no more be synthesized than can a brick building be erected without a sufficient supply of bricks.

The recently announced plans in India to vaccinate some 9,000,000 starving persons in order to prevent further deaths from cholera and other epidemic diseases will fail, in all likelihood, unless, at the same time these persons also receive adequate supplies of protein-rich materials from which to produce antibodies. Evidence for this statement is furnished from World War I, where it was observed in vaccination of starving peoples against typhoid fever, that not infrequently the disease developed even within a few months after vaccination. From a practical standpoint, therefore, these famished people need food with which to replete their bodily protein stores; without it they will continue to lose their capacity to produce antibodies until, finally, some ordinarily mild type of intercurrent infection will become terminal.

Under these adverse circumstances the protein foods assume a nutritional significance out of proportion to that accorded them in normal times because, in severe starvation, the proteins are indispensable both for the reconstruction of wasted tissues and for the rehabilitation of damaged immunological mechanisms. They play an essential part in these processes both because of their chemical composition and especially because in proper combination they bring to the body the eight essential amino acids which cannot be synthesized by it. Without their presence in the diet or in the bodily reserves, a starving person can neither rebuild wasted tissues nor synthesize hormones, enzymes nor antibodies normally. This fact is of paramount importance, therefore, in the planning of relief rations because of the necessity for them to contain a rich assortment of all the essential amino acids as they occur naturally in the high quality protein foods.

FOOD FADS

The extent of food faddism in the field of nutrition will always vary inversely with our knowledge about food facts. A fad is defined as "a custom, amusement or the like, followed for a time with exaggerated zeal." Unfortunately, the word "fad" usually carries with it an unfavorable connotation; I shall use it, however, not in an invidious way, but more as an indication of changing attitudes towards foods.

We have always had food fads, and we have many of them now. Today we pursue with particularly exaggerated zeal the vogues of vitaminism and food enrichment.

Of course there is nothing faddish about a vitamin; vitamins, indeed, are highly important and essential food constituents which vitalize many cellular activities. Without them in the diet in adequate amounts deficiency disease develops. But it is difficult to believe that vitamin deficiencies have suddenly become so incipient in so many of us that we must now spend more than a hundred million dollars annually buying vitamin pills for self-diagnosed ailments suggested to us by skillful advertising. We all know the old saying in medicine that a physician who treats himself has both a fool for a patient and a fool for a doctor. And yet thousands of Americans daily diagnose vitamin inadequacies in themselves, their friends and neighbors, and rush to the corner drug store for vitamin pills. But, as A. J. Carlson has so aptly put it, the people who need vitamins most cannot afford to buy them and those who can afford to buy them probably do not need them. Nonetheless, I freely admit that some of the most glamorous pin-up girls on the American scene owe their zestful buoyancy, according to the advertisements, to the miracle of the vitamin-B complex; unfortunately, however, male pulchritude has apparently not been so readily attained, even after the purchase of the entire vitaminic alphabet. The story is told about almost any luncheon meeting of busy executives that, as the guests sit down, the rattling sound heard round the room is merely made by the vitamin pills shifting cargo under the influence of the gravitational pull.

Vitamins should be bought and eaten in the "protective" foods, the fruits, the green and yellow, leafy vegetables, milk, meat and eggs, except when there is some medical reason for their additional use. The fact that they are harmless when eaten in large and expensive amounts does not justify the fad itself. If one needs only three glasses of water daily for optimal health and happiness, the drinking of nine extra glasses of expensive bottled water causes additional benefit to no one but the bottler and his associates.

A fad practiced by some, which, due to the war, is again gaining ground, is vegetarianism. This is so because the vast wartime economic dislocations are leading steadily to lowered living standards and a definite trentd toward direct cereal consumption. Even in the United States we are now facing the unpleasant fact that we cannot feed enlarged livestock populations with grains suitable for human consumption.

But vegetarianism as a fad has always been practiced by various groups who, for

religious, esthetic or other reasons have not wished to consume animal flesh. Sects have arisen which have also refused even to eat milk, cheese or eggs. Most vegetarians, however, are actually lacto-ovo-vegetarians, and in milk and eggs they secure high quality animal proteins. Furthermore, most modern bread, at least in normal times, contained skim milk powder, thus fortifying it, probably unbeknownst to the vegetarian consumer, with good animal proteins to compensate for those lost in overmilling.

Pure vegetarianism, to be sure, has certain virtues to commend it. For example, it avoids the dangers inherent in diseased flesh due to parasites or bacteria, such as trichinae, streptococci, tubercle bacilli, and bacilli of undulant fever; furthermore, it affords an escape for those sensitive individuals who abhor the smelly realisms of the abattoir. It also allows a higher population density because of greater land economy. It is largely because of vegetarianism that the densely populated areas of India and China have been possible; and because of over-population and the preponderant dependence upon cereal foods, crop failures have caused some of the most devastating peace-time famines, with countless deaths by pestilence. Vegetarianism as a practical problem thus conflicts directly with that of birth control, as the British rulers in India know full well.

In lands where vegetarianism is optional its faddism becomes apparent. It constitutes a medical problem only because the grains, while rich in energy value, are, on the whole, defective qualitatively and quantitatively, in proteins. This is true particularly of wheat, corn and rice because of our modern milling practices which eliminate important vitamins, minerals and proteins. The effects of these food devaluations are becoming more obvious now due to the increasing nutritional needs brought about by the war; and out of the need for correction of these dietary inadequacies has come the "enrichment" program.

Food "enrichment" might better be thought of as a notion than a fad. Perhaps the term "improvement" would have been a better choice, inasmuch as, for the most part, the attempt has been made to restore to foods certain nutritional properties lost during the process of manufacture. Instead of being enriched, however, some of these foods are still not even back to parity. But regardless of the name, there are foods which, either because of natural poverty or because of processing injury, can be improved artificially by adding to them various food constituents.

Food fortification should be more indicated in foods originally deficient in certain dietary elements than in foods impoverished by man. Some of our manufacturing practices are particularly reprehensible in that, by the subjection of naturally good foods to high temperatures and pressures, they depreciate the original nutritional values. For such types of nutritional trauma no amount of so-called enrichment can quite atone, any more than can clean linen substitute for a needed bath.

The most recent utilization of the idea of food enrichment is seen in our present-day attempts to correct the deficiencies of cereals, particularly wheat and corn, by adding to them certain types of vitamins and minerals which have been discarded during milling. We can deprecate this milling practice, but the fact remains that: (1) most people really prefer white bread and (2) whole grain flour quickly becomes rancid. If these two problems could be solved the need for flour enrichment would disappear. Our long-time aversion to "peasant" bread has both a psychologic and physical basis; white bread is thought of as clean and pure, and light bread unquestionably affords considerably greater digestive comfort. And yet we do not prefer white butter, and we go to a lot of trouble now to make our oleomargarine a golden yellow. If we could cultivate a taste for a yellowish bread of the type now used in England as "war bread", made from flour of 85 per cent extraction, more of the nutrient values of the wheat berry could be attained.

Because there was not time to solve

these two important problems in preparation for war and for the feeding of the many people with low purchasing power, the movement to "enrich" flour was instituted a few years ago as a measure to improve white flour. The difficulty is that the enrichment corrects only vitamin and mineral deficiency, whereas the protein values are as low as they were before. It should be emphasized, however, that an important purpose of bread enrichment was also to use flour as a "carrier" for vitamins already low in the over-all American diet, and not just to put back into the flour the food constituents lost in milling.

The "white flour problem" is not particularly serious in normal times because bread does not need to be a complete food and is usually supplemented with high quality proteins. But now that flour must serve as a basis for relief rations for starving peoples its protein inadequacy becomes more serious. Fortunately, however, this can be corrected without much difficulty. Several groups of workers have shown that white patent flour can be further enriched by supplementation with several varieties of high quality vegetable proteins, including soybean flour, corn germ, peanut and cotton seed flours. The resulting blend effectively promotes the growth of young white rats as well as recovery of starved animals evidencing the adverse effects of severe protein undernutrition. Such a protein-enrichment program, therefore, should be of great value now because of its low cost aspects and the availability of these vegetable proteins.

CONCLUSION

It is obvious that many if not most of our food fads have come into prominence because of our ignorance about food facts. Perhaps most of our troubles in this world are essentially man-made; certainly this is true of the deficiency diseases. Without our polished rice and our degerminated wheat and corn flour there would be no beriberi or pellagra. But whether we suffer from overfeeding or underfeeding, the resultant diseases in either case represent nutritional problems which can be solved only as we learn more and more about the circumstances which engender them. In other words, as we learn more about the facts of food, we will gradually concern ourselves less about its fads.

THE ARTHROPOD-BORNE ENCEPHALITIDES OF NORTH AMERICA

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From the time of the historical account by Von Economo of the Viennese epidemic of "epidemic encephalitis" much interest has been placed in this group of diseases.

As these epidemics carry with them a high mortality, and since it has been found that there are so many possibilities of transmission, it is certainly important that the physician be acquainted with the characteristics of these diseases. This is even more important now in times of war, when, if epidemics get started, control may be difficult. The doctors in the service should also keep in mind the possibility of such epidemics in the fighting men.

It seems that little has been done to give a very accurate classification that is workable. The clinical syndromes are often so similar that classification depends mostly on the character of the infecting virus, the locations of the diseases, and the mode of transmission and propagation, rather than upon differences in the clinical findings.

Dingle has suggested the following classification:

Group I. Bacteria, protozoa, and other parasites.

Group II. Viruses.

- St. Louis encephalitis
- Eastern equine encephalomyelitis
- Western equine encephalomyelitis
- Japanese B encephalitis
- Australian X disease
- Forest spring encephalitis of Russia
- Lymphocytic choriomeningitis
- Louping ill
- Virus B
- Poliomyelitis
- Rabies

Group III. Etiology unknown, probably virus.

Encephalitis lethargica (Von Economo's disease)

Hammon, Reeves, and Gray have further classified a portion of Group II into arthropod-borne virus encephalitides; in which group are included: Western and eastern equine encephalomyelitis; St. Louis encephalitis; Japanese B encephalitis; Russian fall-winter encephalitis; Russian spring-summer encephalitis.

A newcomer to this last group has been just reported by Lennette and Kaprowski; namely, Venezuelan equine encephalomyelitis. This was reported from a laboratory in Brazil.

Fothergill has given a classification based on the pathologic picture in which there are two main divisions:

I. Inflammation, the chief pathologic process.

II. Perivascular demyelinization, the chief pathologic process.

Probably this is the most complete classification, but for this paper, that of Dingle and Hammon will be used.

In this paper main comment will be limited to the equine and St. Louis types of encephalitides. Since they are all so closely related in regard to the clinical picture, and especially in regard to the transmission, one could hardly write about just one without including the others.

The Venezuelan type is included because of the recentness of the finding and the interesting clinical picture described.

ST. LOUIS TYPE

In the late summer of 1932 at St. Louis, 38 cases of an unsual type of encephalitis with symptoms similar to that now known as the St. Louis type occurred, in which no etiologic diagnosis was made. In retrospect this was clinically identical to the St. Louis type.

In August, September, and October of 1933, there occurred in St. Louis and Kansas City an epidemic of 1000 cases of a similar disease.

Previous to this time, for a period of 14 years, sporadic cases of encephalitis had been noted in the St. Louis Children's Hospital, which had a seasonal variation with the peak in July and August. It is thought that these cases may have been of the St. Louis type.

In the same year of the first recognized epidemic (1933), much work was done on the etiology and epidemiology. Webster and Wright succeeded in isolating a virus pathogenic for mice from fatal human cases of the epidemic, and Muckenfuss et al. did likewise for the rhesus monkey. Other investigations demonstrated that the disease was caused by a specific agent. This was the first outbreak of an acute encephalitis for which a specific etiologic agent was found. A test was also devised by Webster and Wright succeeded in isolating a virus in which the neutralizing substances found in the serum of convalescents and normal people in the epidemic area could be used to determine not only who had the disease, (whether clinical or subclinical), but also the geographic distribution of the disease.

It was also recognized by the use of similar methods that the disease was not confined to the St. Louis area, but was rather widespread throughout the country. The smaller epidemic occurred in the St. Louis area in 1937 with an increased mortality rate, especially in children. Confusion at this time was likely because of the occurrence of so many cases of poliomyelitis.

In 1941 there occurred a widespread epidemic of both western equine and St. Louis encephalitis in Washington, Arizona, New Mexico, and Texas. The eastern type of encephalitis was also present and represented the first cases of this type reported since the epidemic in Massachusetts in 1938. Also in the same epidemic, patients were noted whose sera were not neutralized by any of the three viruses mentioned, which suggests a new type of virus encephalitis in this country.

ETIOLOGY AND EPIDEMIOLOGY

Casey and Brown, after studying the epidemiologic features of the two St. Louis epidemics, noted that the feature of these epidemics were common to the mosquito-

borne diseases, and that the epidemic appeared simultaneously in the same areas in each of the two epidemics.

Leake, Musson, and Chope, as early as 1934, had reported that the mosquito was the vector, or the disease was spread by contact. The co-existence of the western equine and St. Louis viruses in patients have been reported in the last epidemics of these two diseases in 1941. Both viruses were isolated from the mosquito Culex tarsalis, and neutralizing antibodies to both viruses were isolated in as high as 50 per cent of apparently healthy domestic fowls in the areas of the epidemic. No such findings were found in control animals away from the area. Experimental inoculation of chickens, ducks, horses, mice, monkeys, guinea pigs, pigs, and rabbits has resulted in the finding of the St. Louis virus in the blood of these animals. Inoculation of horses with this virus has resulted in infection, both clinical and inapparent.

Antibodies to the St. Louis virus have been found in the sera of normal and convalescent patients from encephalitis both here in the United States and Africa.

In addition to the demonstration of transmission by the Culex tarsalis as vector; it has also been demonstrated that Culex pipiens Linn and Dermacentor variablis (dog tick) are capable vectors of the disease.

There has been some evidence that transmission by contact is also possible. According to the work of Hammon et al., there are several animals which can be readily infected by intranasal instillations of the virus. Feeding infected mice does not work so well, as shown by Harfood and Branfenbrenner.

However, no attempt at isolation of either the western or the St. Louis type from the nasal washings and other secretions of man or horses has been successful.

Hammon hypothesizes that the animals necessary for the infecting of mosquitoes must have the following characteristics:

1. They should be abundant.
2. They should show no apparent signs of infections. (No epizootics have ever been observed except in horses, which were relatively few in number.)
3. They should have, as a result of a small peripheral inoculation, a reasonably large amount of virus circulating in the peripheral blood.
4. It should theoretically be a bird, because in an area where epidemics occur annually, the reservoir animal should be one which does not bestow a first season's protection to its off-spring by maternal transmission of antibodies, as frequently occurs in mammals.

Experience has shown that very young animals react with higher blood titers than older ones, thus are better potential sources of infection for the vector. This not only applies to the St. Louis type, but is also applicable to the hypothetical animal reservoir of the equine type.

IN HORSES

Equine encephalomyelitis in horses is an epizootic disease, occurring in the late summer and early fall, characterized by extreme lethargy and occurring mainly among pastured animals.

It has been estimated that over a million horses and mules in the United States have had the disease. Even though mules and horses do not have a high economic value; deaths due to the disease have been so numerous that it has been necessary to combat the disease in horses not only because of the danger to the human population, but also because of the economic distress caused to farmers in sections visited by the disease.

A subacute type of encephalomyelitis in horses has been known in Europe for years, but was called Borna. In retrospect it is entirely possible and probable that the disease has been present among the equine population of the United States for years, but has been misdiagnosed as botulism, or some other similar disease. One such epidemic that might have been encephalomyelitis occurred in Kansas and Nebraska in 1912 and 1914.

The disease as an entity did not become definite until 1930, when Meyer, Haring, and Howitt demonstrated a filtrable virus

as the pathogenic organism from the brain of horses dead of the disease. In the following years the disease spread from California to Arizona, Oregon, S. Dakota, Colorado, and Nebraska, and other states west of the Appalachian mountains. Later, in 1933, the disease appeared along the Atlantic seaboard, and when it was noticed that this disease carried a mortality rate twice as great as that in the western sections, a different etiological agent was suspected. Ten Broeck and Merrill demonstrated the immunologic difference of the eastern virus from the western in that same year. Again, in retrospect it is thought the epidemic among horses in Massachusetts in 1872 and 1913 and 1914 was the eastern type. In 1938 there appeared the first real epidemic among horses of the eastern type in Massachusetts. In 1938 and afterward, the disease moved downward along the Atlantic seaboard and along the Gulf Coast. Cases have been reported in Alabama and Texas.

IN THE HUMAN

In 1932 Meyer reported three cases of human encephalitis. These patients had come in close contact with horses ill with encephalitis and had symptoms similar to those of the western type of today. The pathologist's report on the findings in the brain of the one fatal case was that it was an unusual type of encephalitis, resembling those findings in the brain of horses with equine encephalomyelitis.

Meyer also suggested that the brains of future cases of human encephalitis be studied to correlate the human and equine diseases with more definite evidence. However, human cases did not appear during the epidemic among horses until 1938.

In that year Fothergill et al. reported the isolation of the same viruses as the eastern equine strain from the brain of a seven year old male, who had an abrupt onset of high fever, general rigidity, and coma, followed by death 24 hours later. Several other cases were also reported, and they were notable in that they came on about two weeks after the peak of the disease among horses in the same general distribution and attended with about the same high mortality. The disease was most prevalent among the young; only 15 per cent were over 21, and one-quarter were under one year.

In that same year cases due to the western strain were reported in California, N. Dakota, Minnesota, and Saskatchewan; the etiologic diagnosis being made by the isolation of the virus and the demonstration of the neutralizing antibodies in the serum of the patients. Following this, outbreaks of increasing severity were noted in the mid-west and far-east; and, in 1941, the largest epidemic ever recorded occurred in North Dakota and the surrounding territory, 1,080 cases with 96 deaths were reported, and the etiologic agent was shown to be the western strain. Since that time, sporadic subclinical and fatal infections have been reported in laboratory workers.

In December of 1943 Lennette and Koprowski in Brazil reported eight human cases of encephalomyelitis (Venezuelan). These were laboratory workers. Before this, however, two mild cases were described occurring in laboratory workers. Because of lack of adequate information, it is at present impossible to determine the existence of human infection in Venezuela, where the disease is endemic among horses.

ETIOLOGY

The etiology of all three types of equine encephalitides has been shown to be a filtrable virus of small size. Sharp, Taylor, Beard and Beard have made electron micrographic studies of the eastern and western types. They reported that the eastern type has an average size of approximately 40 mu. in diameter, and that it was spherical in form, with an inner dense round or oval region surrounded by an area of less density. They found the western strain to be of the above general structure with an average size of 40.2 mu. They treated the virus with calcium chloride and found the limit of the virus to be more clearly defined with an average diameter of 47.5 mu. They are not sure that such treatment gives the true cell outline.

Lennette and Koprowski make the observation that while the Venezuelan virus is the most lethal of the three equine types for the laboratory animals, it has caused no deaths in the ten human cases thus far reported; that the western type, which is least virulent for laboratory animals, has caused two deaths of four laboratory infections recorded, and that the eastern virus has caused only one non-fatal laboratory infection.

EPIDEMOLOGY

Soon after it became apparent that epidemics of encephalitis in horses disappeared with coming of winter, the possibility of an insect vector of the disease was suggested. In the Massachusetts epidemic, it was demonstrated that several species of aedes mosquito were capable of transmitting the disease. Although the virus has not been shown to occur naturally in this species, the epidemiologic evidence is strongly in favor of the insect as vector. Mention has already been made of the isolation of the St. Louis viruses from Culex tarsalis, also the western type virus has been isolated from the same mosquito. Other insect vectors have been indicated by the appearance of the disease. The western strain has been isolated from naturally infected Tricotoma sanguisga (assasin bug) ; Dermacentor variablis (dog tick) and has been shown capable of transmitting the disease. The variety of host reservoirs for the viruses has been shown to be great, and experiments indicate that many more are possible and probable. The eastern strain has been isolated from the ring-necked pheasant and the pigeon.

Leake, reporting the epidemic of the western strain in and around North Dakota in 1941, could find no definite connection between the disease in horses and man, as the disease in horses had quieted down. However, it had been a heavy mosquito year in that section. It occurred mainly in male workers in rural districts. During that epidemic Cox et al. reported the isolation of the western strain virus from the brain and spleen of a prairie chicken shot in the area during the height of the epidemic. Neutralizing antibodies were found in many people in the area as well as various animals.

PATHOLOGY

The pathology of these diseases (equine) is similar to that seen in animals. On gross examination, there is severe edema and congestion of the spinal cord and brain. The convolutions were flattened.

Micro examination reveals focal areas of nerve cell destruction, with much infiltration of polymorphonuclear leukocytes and microglial cells. Numerous small thrombi were noted in the blood vessels of the brain and other parts of the body.

In the St. Louis type the pathology is similar to the equine type with congestion and edema of the brain and spinal cord. Cuffing around the smaller vessels mainly with mononuclear cells is present. Focal accumulations of cells without relation to the blood vessels is present. Neuronophagia is also seen.

Since no deaths have been recorded from the Venezuelan type, the pathologic picture cannot be described.

Since the encephalitides, which are discussed in this paper, are so similar in their clinical aspects, and because differential diagnosis is almost impossible on this basis, they will be discussed together in respect to clinical manifestation.

Hammon, who has done so much work with these diseases, has described the clinical picture in infants, in adults, and in children.

IN INFANTS

The onset is rather sudden with fever and refusal to feed, soon followed by vomiting, twitching, rigidity, stiff neck, bulging fontanel, convulsions, and severe dehydration, with a marked strabismus occurring at times. The temperature reaches 103° to 105°, sometimes 106° within 24 hours. It remains at this level for 24 to 48 hours, and usually falls to normal within two to four days. Cyanosis is usually present from the beginning. Convulsions and twitching may be almost constant or sporadic, bilateral or unilateral. The motor activity usually disappears with the fever,

but may last longer, and the spasticity leaves later. If the infant lives, it appears normal within five to seven days after the onset.

With proper treatment the mortality rate is not high among infants, but unless repeated lumbar punctures are done, the sequelae become more serious.

Ten to forty per cent of cases recognized in epidemics, in children under six months, have shown such an outcome of the disease. Among the sequelae which may become manifest are: (1) Failure to develop normally; (2) spasticity; (3) small head size; (4) overlapping sutures; (5) mental retardation; (6) blindness; (7) epileptiform seizures; (8) enlarged ventricles.

The eastern type runs a much more severe course in infants, and the mortality rate has been almost 65 per cent. Death occurs within 24 to 48 hours of the onset.

IN ADULTS, AND CHILDREN (OVER THREE YEARS)

In this group the disease shows many more varied forms. The onset is abrupt with "grippe" like symptoms, headache is one of the most frequent symptoms with severe malaise, chilly sensations, fever, backache, and abdominal distress. Within 24 hours the temperature may reach 101° to 105°, depending on the severity of the case. It is during this stage that nausea and vomiting frequently ocuur. On the second to fourth day, the temperature reaches its peak and remains at this level for 24 to 48 hours, then falls by lysis.

SIGNS AND SYMPTOMS

Those due to the encephalitis usually appear at, or just before the peak of the fever. The headache becomes more severe; mental depression is present (with slowed motor activity and speech), which may even become stupor, and from which the patient is aroused with difficulty. Rigidity of the neck and back is also seen, but almost never as great as is seen in the meningitides. The pupils are small and respond to light sluggishly. Rarely is nystagmus or strabismus noticed. The reflex change is not constant. Scrotal or plantar reflexes may or may not be normal. Superficial abdominal reflexes are almost always absent or unilateral. Sweating is very profuse, and dehydration must be guarded against.

During the next few days, in contrast to the disease in the infant, the neurologic symptoms and signs may become worse, even though the temperature be falling. These may also have added to them: (1) Speech difficulties; (2) intention tremor; (3) mild mental confusion; (4) deeper stupor or coma with involuntary bowel and urinary discharge.

In the severe cases, edema of the face is common. Patients in this category often remain stuporous and comatose long after the temperature has subsided, and the convalescence usually takes place over a period of months.

Instead of exhibiting the above picture, it may be one of excitement and delirium. Also, instead of being severe, it may be so mild as to be only a headache, which lasts for a short while.

Among the elderly, complications and residuals are more common. Pneumonia and renal insufficiency of a previously damaged kidney are among the complications and causes of death.

Residuals, except in the elderly, are much less common than in the infant group. Among these are: tremor, weakness, nervousness, insomnia, mental deficiency, and psychoses. Parkinsonism is uncommon.

The eastern type is limited mostly to children; adults rarely being infected, but the mortality is increased over the western type, as one would expect.

The Venezuelan type has an onset similar to influenza with a severe headache, that is unrelieved by any drug and is very persistent. In most cases, it was localized to the frontal region. Body aches and pains in the leg calves were noted; photophobia was a common finding. There was drowsiness, but the severe headache prevented sleep in most cases, however, somnolence was noted in one case. As yet, no sequelae have been noted, and the disease is short in its course as the other equine type. No deaths have been reported.

DIFFERENTIAL DIAGNOSIS

Besides the three encephalitides (western, eastern equine, and St. Louis types), there are two other encephalitides, which cause confusion, namely Von Economo's encephalitis or encephalitis lethargica and lymphocytic choriomeningitis.

In the St. Louis type most of the cases are found in adults in late summer and early autumn. The onset is sudden, the course is acute, the sequelae are rare, and the mortality rate is about 20 per cent. The cerebrospinal fluid shows variable increase in pressure, the white cell count varies from 10 to 1000, with monocytes predominating. Circulating antibodies may already be present in endemic areas with a rising titer as the disease progresses. The presence of the specific virus can be noted in the brain tissue, but it is questionable that it can be found in the cerebrospinal fluid or the blood. The protein of the cerebrospinal fluid may be elevated, but the sugar is normal in these types.

In the eastern type the seasonal occurrence is as in the St. Louis type and western type, but it is found most often in children, the clinical course is more severe, the mortality rate is higher, 70 per cent, and sequelae are much more frequent. The cerebrospinal fluid may show the same findings as the St. Louis type, except the cell count is higher, 10-2000, and the polymophonuclear cell is the one that predominates early in this disease; later, the monocyte becomes more numerous. The specific virus is located as in the St. Louis type. Circulatory antibodies are found as in the St. Louis and western types.

The western type may be found in any age group with the seasonal occurrence the same as the other two. The onset is sudden and acute, sequelae are often seen in children and elderly people, but are not so common in the middle-aged group. The mortality rate is greatest in children and older people, being only around 5 per cent in the young adults. Altogether, the mortality rate is about 20 per cent. The cerebrospinal fluid is similar to the other, except the cell count is 100-1000, and as in the eastern type, the polymophonuclear cell is most numerous early, and the monocyte, late in the disease. The specific virus has been isolated from the brain tissue, the blood, and the cerebrospinal fluid. Circulatory antibodies are present.

Von Economo's type occurs mainly during the winter months and may affect any age group. The mortality rate is about 30 per cent. The onset is varied; it may be sudden, gradual, or inapparent. The clinical course is chronic and sequelae are frequent and progressive, notable among them being Parkinsonism. The cerebrospinal fluid shows a count of 0-100 with the monocyte predominating. No specific virus has been isolated for it, nor have any neutralizing antibodies been found. It has been rarely seen in this country since 1926.

Lymphocytic choriomeningitis occurs at any time of the year in any age group. The onset is sudden, the clinical course is acute, sequelae are very rare, and the mortality rate is zero. The cerebrospinal fluid may have the specific virus present and shows a cell count of 100-3000 with the lymphocytes predominating. Circulating antibodies are present, and the specific virus has also been isolated from the blood, but not from the brain.

DIAGNOSIS

The clinical picture in the presence of an epidemic may be the lead to the diagnosis, but it is impossible on this basis alone. The findings of the cerebrospinal fluid also help, but the diagnosis is verified by sereologic examination.

The most widely used is the finding of a rising titer of specific neutralizing antibodies in the blood serum. Five c. c. of coagulated blood is taken, and the serum is used for the tests. It is necessary to take at least two specimens, one at the beginning of the disease, and another thirty days after. Three are better, and, in this case, the second should be taken two weeks after the onset, and the third six weeks after the onset. The findings of a rising titer over the period makes the diagnosis. One test is not sufficient because in the endemic areas one finds very often a high titer in

the general population so that at least two tests must be run to determine the titer curve.

A complement fixation test has been devised to make a more rapid diagnosis with a fair degree of accuracy, but this does not have much statistical evidence in its favor at the present time.

TREATMENT

Treatment is mainly symptomatic. Convalescent serum, or specific artiserum, has been tried, but the fact that it would have to be given early in the disease makes it impractical, unless a way of diagnosing the condition earlier is made. Besides general nursing care and the maintaining of fluid balance, the most important thing to do is prevent complications and sequelae.

In infants and children, repeated lumbar punctures are the best means of preventing the damage to the brain and the after effects thereof.

In adults, after the fever has subsided, complications are the physician's worry. The patient must be watched to make sure there is no urinary retention, the bowels must be kept clear, and nasal secretions and mucous in the mouth must be removed to prevent aspiration, often with pneumonia. Since the patient remains comatose so long after the fever is down, it is not the disease itself that one has to combat, but the above condition.

Urinary tract infections and pneumonia, two of the most frequent causes of death in these diseases, may be controlled by the sulfonamides. They may even be given as a prophylactic.

PREVENTION

While vaccination gives immunity for periods of about a year, it is only indicated in laboratory workers, and others likely to contract the disease. Control of the disease in horses has been very effective by vaccination; since the horse is an important reservoir, control of the disease through vaccination of horses is important.

Mosquito control is the most logical method of prevention and is the one most widely used. Personal protection against the mosquito is also wise in endemic cases.

CONCLUSIONS AND SUMMARY

The arthropod-borne encephalitides of North America and the late-reported Venezuelan equine type have been discussed.

The confusing clinical picture plus the high mortality rate and the probability of a large animal reservoir makes it imperative that more attention be given to this disease —as to better methods of diagnosis, treatment, and control.

The possibility of other types of insect-borne encephalitides must also be remembered in the differential diagnosis.

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APOLOGIA

It is with regret that we have to make this request of our readers: Please do not be disturbed by the fact that the Journal is not appearing, as it has for many years, promptly on the first of the month. On account of the labor shortage the printers of the Journal have only a limited staff, so small as a matter of fact that it is at the present time truly impossible for them to complete printing of the Journal by the end of each month.

The difficulty that the Journal has had in printing has not been confined to it alone. Even some of the very large national weeklies and monthlies have had the same trouble; for a time it was really very difficult to secure copies of these large nationally circularized publications. We have been singularly fortunate up to the present time not to have this trouble.

It so happens that the operator of the linotype machine and the typesetter have to do a type of work which is quite hard on the eyes and requires meticulous observation of details. The printers do not want to work overtime because of the eye and nervous strain. One of the large Eastern publishers of medical books recently told the editor that as a matter of fact they found that printers, if they work overtime, were making so many mistakes and errors that actually better results were obtained when the question of fatique was eliminated,—that the printer could accomplish more during the usual eight hour day than he could when he worked overtime.

It is to be hoped that the late appearance of the Journal will be straightened out sooner or later but in the meantime we ask our readers' indulgence and hope that they will accept these apologies.

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THE INDUCTION OF PRE-MEDICAL STUDENTS

General Hershey has ruled that no longer can boys who pass the age of eighteen be deferred for the study of medicine, and that boys who planned and contemplated going into medicine will have to go into the Army. The seriousness of the situation is recognized by Mr. Paul McNutt, War Manpower Commission, but General Hershey says he has to obey the orders of the General Staff which is unwilling to exempt a few thousand students which would make possible continuing the steady flow of physicians into the ranks of medicine. It will be impossible for medical schools to fill their ranks with 4F's and girls so that five years from now the graduating classes will be extremely small. This will cause a tremendous difficulty in civilian practice, if the war is over as we devoutly hope it will be. One of the great difficulties will be

staffing hospitals. It is almost impossible to conceive of running a large hospital with a very small staff of interns and residents. The number of these men has already been cut down considerably, but if they are reduced fifty or seventy-five per cent more how under the sun will the Charity Hospital and the larger private institutions continue to give the service to civilians that they are now giving, is a question which causes great worry and perturbation to the administrative officers of these institutions.

Fortunately, in Congress there are enlightened men who can appreciate what will happen to the care of the civilian population if the number of doctors is materially reduced each year. House Bill, No. 5027, has been introduced by Representative Louis E. Miller of St. Louis, exempting pre-medical and medical students, and Senator Lester Hill of Alabama is planning to do the same in the Senate.

We are glad to report that the Chairman of the Committee on Public Policy and Legislation of the State Medical Society, Dr. O. C. Rigby of Shreveport, is active in this matter, and he and his commmittee will take measures to give vigorous support to these bills in the House and Senate.

DERMATOPHYTOSES

Fungous infections are extremely common. It is said that one-third of the people in this country suffer from athlete's foot. It is a nasty, mean and annoying minor disability which becomes of more serious moment when a man enters the Army because often a soldier does not have the opportunity of treating properly these dermatophytoses which get worse and finally may actually incapacitate a man. In a recent article in the Bulletin of the United States Army Medical Department the treatment of this annoying condition was discussed and inasmuch as the civilian population as well as the military population are victims of this disorder, it might not be amiss to mention a few of the admonitions of the group of authors* who prepared this paper.

There are certain general hygienic principles that must be observed, such as cleanliness by frequent washing of the feet and frequent changing of the socks. After washing the feet should be dried very carefully, particularly between the toes, but vigorous rubbing should not be employed. On every possible occasion permit aeration by removing the shoes and socks and at every opportunity elevate the feet. Strong fungicides and antiseptics should not be employed. Once in a while in chronic cases with involvement of the thick stratum corneum of the sole more vigorous treatment may be necessary. For example, for intertrigo an effective fungicidal paint is made up with benzoic acid 5 grams, acetone 15 c. c., cotton seed oil 85 c. c. For more obstinate cases an ointment is recommended containing salicylic acid 10 grams, precipitated sulfur 10 grams, starch powder 30 grams and petrolatum 50 grams. Whitfield's ointment should never be used except in half strength. Fissured and denuded cases should be painted with 5 per cent aqueous silver nitrate. For more severe lesions a gauze impregnated with some bacteriostatic agent is applied as an open dressing. Recommended is the following: zephiran concentrate (10 per cent) 5 c. c., water 20 c. c., lanolin 25 c. c., petrolatum 50 c. c. Frequently 5 per cent sulfathiazole ointment will succeed when this zephiran ointment fails. Lesions on the plantar surface of the foot require intensive treatment, the details of which will not be given here.

After the active lesions have subsided, hygienic measures should be followed continuously as recurrence is extremely common. Patients should be given a good fungicidal paint to be used over the entire surface of the toes, toenails and soles of the feet once a week. A formula for such paint is: tincture of iodine (7 per cent) 15

*Hopkins, J. G., et al.: Treatment and prevention of dermatophytosis and related conditions, Bull. U. S. Army Med. Dept., 77:42, 1944.

c. c., salicylic acid 3 grams, benzoic acid 6 grams, camphor 10 grams and alcohol sufficient to make up 100 c. c. solution.

These are some of the methods for the treatment of dermatophytoses that have been developed by the Office of Scientific Research of the National Research Council and Columbia University. As they seem to be successful in the treatment of an extremely common condition in the Army they should prove equally effective, if not more so, in civil life.

ORGANIZATION SECTION

The Executive Committee dedicates this page to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

MEDICAL ACTIVITIES

It may be interesting to know that the Executive Committee held a very important meeting on May 27. You may, therefore, like to learn of some of the important matters which were discussed for the benefit of the organization. Although we did not anticipate having a very large annual meeting owing to war conditions, it was very gratifying to report that we had a total registration of 652. Also you may be interested to know that we are only about five per cent off of our regular membership in comparison with this time last year. Owing to the importance of medical education and especially as a constructive plan for postwar purposes, the president and Executive Committee deemed it advisable to enlarge the Committee on Medical Education to five members instead of three. It is desired that this committee will make a comprehensive study of the present and future needs for our medical institutions incident to the war and the peace which follows it.

Many legislative bills which were presently being considered by the Legislature were discussed. The Committees on Public Policy and Legislation of the State Medical Society and Orleans Parish Medical Society were cooperating one hundred per cent to support bills of value to the medical profession and to oppose those inimical to the practice of medicine. The Executive Committee went on record as opposing any bills that will lower the standards of medicine or any of its branches in the state.

In keeping with the desire to participate in constructive matters in relation to medicine and help in constructive plans for the future, the State Society through the president became a participant in the newly organized Business, Trade and Agricultural Association. They have a state council upon which the Medical Society will be adequately represented by Dr. Rhett McMahon, president-elect, when meetings are held in Baton Rouge, and Dr. E. L. Zander, when meetings are held in New Orleans.

Some very constructive recommendations of the past Arrangements Committee, Dr. Daniel J. Murphy, Chairman, were discussed and acted upon. That arrangements be made whereby the meetings of the New Orleans Graduate Medical Assembly and the Louisiana State Medical Society be far enough apart so as not to penalize the State Society's convention by making it more difficult to obtain sufficient exhibitors to pay for the expenses of the convention. Motion was made and carried that a committee be appointed to meet with representatives of the New Orleans Graduate Medical Assembly to adjust the question of dates, if possible. It was the opinion of the members present that such a committee should be composed of New Orleans men. Because of the fact that so many of our membership complained about contraceptive exhibits being displayed at our meeting, it is recommended that for peace and accord these companies be left off of our exhibitors list. When a supper dance is proposed, it is recommended in order to save money, that the tickets to same be distributed on the day of the supper dance so that one can estimate

more closely the number of probable guests. It is regrettable that our attendance at the function of the Presidential Address is so poorly attended. Therefore, in order to assure a larger and more representative attendance, it is suggested that this function be joined with a smoker or some other type of attendance producer. Motion was made and carried that the chairman of the next Committee on Arrangements be empowered to arrange the meeting according to suggestions of the present chairman.

The executive officers have not yet been able to settle the time and place of the annual meeting of the Society in 1945. The final decision will be based upon the exigencies of the war and whether it is desired to have a full meeting as we had in 1944 or simply a business meeting. An appropriate committee has been appointed to discuss with the New Orleans Graduate Medical Assembly the selection of dates, in order that our meetings will not conflict, and unquestionably as soon as this important feature is settled more definite information will be available as to our next annual meeting.

Dr. C. C. deGravelles, our past president, presented to the Executive Committee a very interesting report of his recent trip to Washington in regard to the Emergency Maternal Infant Care plan. Although he was received with open arms and listened to with a great deal of interest the EMIC plan was continued in force in the Children's Bureau and appropriations for same increased over last year.

Our president has been very busy with appointments of committees and taking care of work now which has been intensified as a result of the Legislature and the numerous medical bills which had to be reviewed and attended to by our Committee on Public Policy and Legislation.

You may be interested to know something about the status of medical legislation which confronted the Committees on Public Policy and Legislation of the State Society and Orleans Parish Medical Society during the present session of the Legislature. Unquestionably, on account of the number of medical bills in which the profession was interested, there developed greater activity on the part of the members of the committees than had been necessary in the past. They have met these problems successfully and to the benefit of the medical profession, giving of their time and energy in order that the practice of medicine in this state will be maintained on the high plane as it has in the past. It was only by this timely cooperation by the two legislative committees that such wonderful results were accomplished.

Owing to the fact that the Legislature has not yet adjourned and some of these important matters are still pending before that body for disposition, it would be very premature and untimely to mention any one bill specifically. Besides, owing to the unusual opportunity for publicity through the channels of our Journal it might be derogatory to the best interests of the State Society to print verbatim the positions of the committee taken on many of these bills. In all there were over 150 bills reviewed, about forty of which appertained to medical subjects and problems. Suffice it to say that I know the medical profession of this state will be more than gratified to know of the favorable results accomplished. At a later date it might be wise to deal with specific bills more in detail after the present session of the Legislature.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

CALENDAR OF MEETINGS

July 5. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheater, 1:30 p. m.
Clinico-pathologic Conference, Marine Marine Hospital, 7:30 p. m.

July 6. Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.

July 10. Scientific Meeting, Orleans Parish Medical Society, 7:30 p. m.

July 19. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheater, 1:30 p. m.

Clinico-pathologic Conference, Marine Hospital, 7:30 p. m.
July 20. Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.
July 26. French Hospital Staff, 8 p. m.
Catholic Physicians' Guild, 8 p. m.
July 27. Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.
DePaul Sanitarium Staff, 8 p. m.
July 28. L. S. U. Faculty Club, 8 p. m.
New Orleans Hospital Dispensary for Women and Children Staff, 8 p. m.

During the month of June the Society held one regular scientific meeting. At this meeting the following papers were presented: Carcinoma of the Larynx by Dr. F. E. LeJeune; Diagnostic and Therapeutic Value of Bronchoscopy by Dr. George J. Taquino. Dr. L. W. Alexander opened the discussion to Dr. LeJeune's paper; Dr. Louis A. Monte opened the discussion to Dr. Taquino's paper. Motion pictures on Massage—Occupational Therapy were also shown at this meeting.

Drs. Joseph A. D'Antoni, Granville A. Bennett, and Harry A. Senekjie participated in the refresher course in tropical disease held at the Tulane University School of Medicine during the week on May 15.

Speakers at the refresher postgraduate course in pediatrics at the Tulane University School of Medicine May 8-11 included Drs. Ralph V. Platou, Joseph D'Antoni, William B. Clark, J. D. Russ, Roy de la Houssaye, Guy A. Caldwell, Allan J. Hill, Julian Graubarth, and Branch Aymond.

Among the speakers at the two-day convention of the negro doctors, dentists and pharmacists of Louisiana at Flint-Goodridge hospital were: Drs. Waldemar R. Metz, M. L. Pareti, Val H. Fuchs, and Rupert E. Arnell.

Dr. Theodore J. Dimitry was elected and has been formally confirmed as Regent for District No. 11 (Arkansas, Louisiana and Mississippi) of the International College of Surgeons.

Drs. Edmund Connely, Lewis A. Golden, Walter Otis, Randolph Unsworth, Theodore A. Watters, Dean Echols, and Gilbert Anderson attended the meetings of the American Psychiatric Society in Philadelphia and the Harvey Cushing Society and American Neurological Society in New York in May.

Dr. Daniel J. Murphy spoke on "The Family, God's Plan Fulfilled" at a meeting of the Catholic Parents' Forum at the Roosevelt Hotel, May 10.

Dr. Henry Ogden has been elected to the Executive Committee of Regents of the Southwest Allergy Forum.

Drs. Urban Maes, J. D. Rives, and Lawrence O'Neal attended the annual meetings of the American Surgical Association and the American Association for Thoracic Surgery in Chicago during May.

Dr. P. T. Talbot addressed the Kiwanis Club of Amite on the Wagner-Murray Senate Bill 1161.

Dr. Gilbert C. Anderson was elected vice-president of the Harvey Cushing Society at the annual meeting in New York, May 18.

Dr. W. A. Sodeman has been re-elected secretary-treasurer of the local chapter of Sigma Xi; Dr. Grace Goldsmith was named to the Executive Committee.

Dr. I. L. Robbins addressed the B'nai B'rith Women's Auxiliary on "Daniel Deronda."

Dr. Julius Lane Wilson was installed as president of the American Trudeau Society, the medical section of the National Tuberculosis Association, at the annual meeting in Chicago, May 9-12. Dr. Chester A. Stewart also attended the meeting.

Dr. John R. Schenken addressed the Traffic Club of New Orleans on "Cancer and its Control."

DANIEL J. MURPHY, M. D.,
Secretary.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

DR. ROY B. HARRISON HONORED

A committee of 19 outstanding men have been selected by the Advisory Council on Medical Education to study the problems of post-war medical training. Dr. Harrison is one of the group who will make up this committee. He is the only member from the South and his selection is an indication of Dr. Harrison's national reputation as a man of intelligence, broad-vision and an able representative of the medical profession.

FIFTH DISTRICT MEDICAL SOCIETY

Dr. Val H. Fuchs, President of the State Medical Society, Dr. John Menville, Dr. J. D. Rives, and Dr. Edgar Hall, all of New Orleans, attended the meeting of the Fifth District Medical Society in Monroe on Thursday, June 22.

L. S. U. MEDICAL SCHOOL NOTES

The Department of Pathology and Bacteriology of Louisiana State University School of Medicine received the gold medal, the highest award for exhibits, at the meeting of the American Society of Clinical Pathologists in Chicago. The title of the exhibit was The Pathology of Amebiasis, Malaria and Histoplasmosis.

Two faculty members of the Louisiana State University School of Medicine participated in the medical program which was given by the Fifth District Medical Society of Louisiana at Monroe, Louisiana, on Thursday, June 22, at 6:30 p. m.

Dr. Edgar Hull, Director of the Department of Medicine, spoke on The Threat of Tropical Diseases.

Dr. James D. Rives, Clinical Professor of Surgery, spoke on The Diagnosis and Treatment of Carcinoma of the Rectum and Recto-sigmoid.

Dr. P. Jorda Kahle and Dr. R. F. Sharp, of the Department of Urology, attended the annual meeting of the American Urological Association which will be held in St. Louis, Missouri, June 19-22.

After leaving the American Medical Association meeting in Chicago, Dr. R. E. Arnell went to Hershey, Penna., where he presented a paper on A Therapeutic Regimen for Eclampsia: Based on a Personally Conducted Series of 142 Consecutive Cases Without a Maternal Fatality before the American Gynecological Association on June 19, 1944.

At the meeting of the American College of Chest Physicians in Chicago, Dr. C. A. Stewart, Director of the Department of Pediatrics, presented a paper on Tuberculosis Control Programs on June 10.

The Department of Pathology and Bacteriology presented two papers and three exhibits at the annual meeting of the American Society of Clinical Pathologists in Chicago and the Department of Public Health contributed one exhibit: Dr. John R. Schenken read a paper on Disseminated Granuloma Venereum, of which he and Dr. Emil Palik are the authors, and Dr. E. L. Burns presented a paper on Mycetoma Pedis, which he, Dr. Emma S. Moss, and Dr. John W. Brueck of the Department of Pathology and Bacteriology wrote. The exhibits are: The Pathology of Malaria; The Pathology of Amebiasis; The Pathology of Histoplasmosis; and, from the Department of Public Health, A Comparison of Strongyloides Stercoralis with Necator Americanus by Dr. Marion Hood.

Dr. L. W. Williams of the Department of Anatomy staff attended the annual meeting of the Association for the Study of Internal Secretions which was also held in Chicago, on June 12 and 13, during the American Medical Association meeting.

CHARITY HOSPITAL

A meeting of the Medical Section of the Charity Hospital Visiting Staff was held on Tuesday, June 20, 1944, at 8 p. m., in the auditorium. The following most interesting program was presented:

1. A case illustrating problems in the diagnosis of Addison's disease, by Dr. W. H. Gillentine.
2. Deviations in the prothrombin time in carcinoma of the cervix, by Drs. M. Garcia and J. V. Schlosser.
3. Case presentation by Department of Medicine of Louisiana State University.

SOUTHERN BAPTIST HOSPITAL

The regular monthly Clinical Staff Meeting was held on May 30, at 8 p. m., in the chapel of the hospital. Dr. Douglas Donath, U. S. Marine Hospital, on invitation of the staff, gave a motion picture demonstration of the surgical treatment of ascites. The death report presentation was made by Dr. W. H. Gillentine.

A meeting of the Clinical Staff was held on June 27 at 8 p. m. in the hospital. The following program was presented: Stricture of the Larynx by Dr. C. L. Cox; Hypertension of Renal Origin in Men by Dr. W. H. Gillentine; Death Report by Dr. Joe Wells.

AMERICAN MEDICAL ASSOCIATION

The following members of the Louisiana State Medical Society attended the meeting of the American Medical Association in Chicago, June 13-16: Drs. John Adriani, New Orleans; Ruth G. Aleman, New Orleans; Charles Bahn, New Orleans; Woodard D. Beacham, New Orleans; C. H. Binford, New Orleans; Donovan C. Browne, New Orleans;

George Burch, New Orleans; B. I. Burns, New Orleans; Edgar Burns, New Orleans; Guy A. Caldwell, New Orleans; Wm. B. Clark, New Orleans; C. Grenes Cole, New Orleans; Donovan F. Davis, Lake Providence; B. J. DeLaureal, New Orleans; V. J. Derbes, New Orleans; Theodore J. Dimitry, New Orleans; Vincente D'Ingianni, New Orleans; Dean H. Echols, New Orleans; James Q. Graves, Monroe; Roy B. Harrison, New Orleans; George Hauser, New Orleans; Ralph H. Heeren, New Orleans; Arthur A. Herold, Shreveport; James K. Howles, New Orleans; Sydney Jacobs, New Orleans; Barron Johns, Shreveport; C. Gordon Johnson, New Orleans; Alfred L. Lewis, Amite; Frank L. Loria, New Orleans; John G. McClure, Welsh; J. W. McLaurin, Baton Rouge; L. D. McLean, New Orleans; W. R. Mathews, Shreveport; M. W. Matthews, Shreveport; Emma S. Moss, New Orleans; Walter Moss, Lake Charles; John H. Musser, New Orleans; Alton Ochsner, New Orleans; Neal Owens, New Orleans; Emile Palik, New Orleans; C. L. Peacock, New Orleans; Rawley M. Penick, Jr., New Orleans; F. W. Pickell, Baton Rouge; William H. Pierson, Natchitoches; I. L. Robbins, New Orleans; Robert A. Robinson, New Orleans; Wallace Sako, New Orleans; John R. Schenken, New Orleans; Robert F. Sharp, New Orleans; John S. Shavin, Shreveport; Daniel N. Silverman, New Orleans; William A. Sodeman, New Orleans; Gretchen V. Squires, New Orleans; C. A. Stewart, New Orleans; T. B. Tooke, Jr., Shreveport; Herbert L. Weinberger, New Orleans; Theodore A. Watters, New Orleans; S. George Wolfe, Shreveport.

Louisiana physicians were well represented on the scientific program of the American Medical Association. The following is an account of their activities.

The following papers were read by Louisiana men:

"Bagasse Disease of the Lungs" (Lantern demonstration), by Dr. W. A. Sodeman and Dr. R. L. Pullen, New Orleans.

"Intractable Amebic Colitis" (Lantern demonstration), by Dr. D. N. Silverman and Dr. Alan N. Leslie, New Orleans.

"The Effect of Moisture on the Absorption Effiency of Soda Lime" (Lantern demonstration), by Dr. John Adriani, New Orleans.

"Problems in the Surgical Treatment of Congenital Megacolon" (Lantern demonstration), by Dr. Rawley M. Penick, Jr., New Orleans.

"Protein Deficiencies in Pregnancy" (Lantern demonstration), by Dr. Rupert E. Arnell, New Orleans and Dr. Daniel W. Goldman, Shreveport.

"The Early Immunization Against Pertussis" (Lantern demonstration), by Dr. Wallace S. Sako and Dr. W. L. Trueting, New Orleans; David B. Witt, Surgeon (R), U. S. P. H. S. and S. J. Nichamin, Surgeon (R), U. S. P. H. S.

In addition to these papers Dr. Guy A. Caldwell presented the chairman's address at the Section on Orthopedic Surgery. Dr. T. A. Watters was vice-chairman of the Section on Nervous and Mental Disease, and Dr. Alton Ochsner was secretary of the Section on Surgery, General and Abdominal.

Dr. Edgar Burns discussed a paper on "Pyelocystanastomosis" and Dr. Donovan C. Browne was listed for the discussion of the paper by Dr. J. Arnold Bargen on "Inflammatory Lesions of the Colon."

There were two scientific exhibits, both from the Department of Medicine of Tulane University, the one exhibit by Drs. George E. Burch and T. Winsor, the other by Drs. H. T. Engelhardt and V. J. Derbes. The first of these two exhibits was on the "Clinical Applications of Phlebomanometer" and the second one was on "The Heart in the Asthmatic Child."

A REQUEST

The Journal is completely out of the February 1943 and 1944 numbers, and would greatly appreciate any help that might be given to the Journal by physicians who may have these numbers and who would be willing to donate them to the Journal. Constant requests have come in for these particular issues and we are unable to grant these requests because we have no more copies.

INFECTIOUS DISEASES IN LOUISIANA

The Louisiana State Board of Health reported that for the week ending May 13 there were reported 36 cases of pulmonary tuberculosis, 31 of measles, and 12 of mumps. There were no other diseases reported in numbers greater than 10, a really very remarkable morbidity record. Of the unusual diseases there were listed four cases of poliomyelitis and seven cases of typhoid fever were scattered over the state, no one parish having more than one case. Were it not that eight cases of mumps originated in army camps in this particular week there would have been only two diseases occurring in double figures. The week ending May 30 was not quite as good as the previous week. During this week there were listed 74 cases of measles, 54 of mumps, 51 of malaria, 27 of pulmonary tuberculosis, 12 each of unclassified pneumonia and of meningococcus meningitis, and 10 of septic sore throat. There were seven cases of poliomyelitis reported this week, four from Orleans Parish and the other three from miscellaneous parishes in the state. A large number of meningitis cases were also more or less sporadic. Jefferson Parish had four such cases, Orleans Parish two, and the remainder were distributed no more than one to a parish. For the week terminating May 27 there were listed 34 cases each of septic sore throat and of measles, 30 of pulmonary tuberculosis, 20 of unclassified pneumonia,

27 of mumps, 24 of malaria. There were four cases of poliomyelitis reported this week, five of typhoid fever, and four of meningitis. The week ending June 3 contained the venereal disease statistics for the previous four weeks. During this period of time there were reported 1,233 cases of syphilis, 1,170 of gonorrhea, 67 of chancroid, 12 each of lymphopathia venereum and of granuloma inguinale. In addition to these diseases that are reported each month, the following diseases that are reported weekly occurred in double figures, 37 cases of septic sore throat, 31 each of measles and of unclassified pneumonia, 23 of mumps, 16 of malaria, and 13 of pulmonary tuberculosis. This week Terrebonne and Orleans Parishes each reported two cases of poliomyelitis and St. Helena one. There were only three cases of meningococcus meningitis.

It must not be forgotten that many of these infectious and reportable diseases are reported from military sources as for example the 16 cases of malaria which were listed this week, and the same may be said of mumps.

HEALTH OF NEW ORLEANS

The Bureau of the Census, Department of Commerce, reported for the week ending May 20 there were 148 deaths in the City of New Orleans as contrasted with 139 the previous week. Of these deaths there were 103 in the white population of the city and 45 in the colored. The total number of deaths also comprised 20 deaths in children under one year of age, 12 white, 8 negro. The following week there was a sharp decline in the total number of deaths among the people of New Orleans. There were 119 people dying this week, 65 of whom were white, 54 of whom were colored, and 15 of whom were under one year of age. The death rate went up in the city in the week which ended June 3. Of the 134 deaths, 92 were in the white, 42 colored, and 25 in small infants. The death rate in the City of New Orleans is lower than 1943, at which time it was the lowest that it has ever been in the annals of the city. There have been approximately 163 less deaths in the first 22 weeks of the year than there were in 1943.

DR. NICHOLAS F. BRAY
(1880-1944)

Dr. Nicholas F. Bray of Springfield, La., was born in 1880 and graduated from the St. Louis Physicians and Surgeons College in 1908. He had been a resident of Springfield for twenty-five years. He died in Springfield on June 16, 1944.

DR. ERASMUS DARWIN FENNER
(1868-1944)

It is with sincere regret that we record the passing of Dr. Erasmus Darwin Fenner, one of the outstanding physicians of New Orleans. Dr. Fenner was known not only on account of his supreme skill in his specialty, surgical diseases of children, but also because of his delightful personality. He was a man who was admired and respected and liked by his colleagues and by his friends.

Dr. Fenner was at one time Professor of Orthopedic Surgery at Tulane, retiring on account of age. For over fifty years he was connected with Charity Hospital, and in spite of the fact on account of age he was made emeritus member of the staff, he still continued his interest in this institution and in the small child, to untold thousands of whom he had given surcease and made their lives happy.

Dr. Fenner's medical career is an example to all young men, but in addition to the good deeds that he did he was active in organized medical circles and former president of the Orleans Parish Medical Society among other positions that he held in the organization. He was a member of Base Hospital Unit Number 24 (Tulane) in 1917 where he obtained the rank of major.

Dr. Fenner's grandfather was one of the outstanding physicians of the state in his day, and a founder of the New Orleans Medical and Surgical Journal.

A loved member of the medical profession has just died. We all who knew Fenner grieve at his going and feel that he left a mark in medical circles in the City of New Orleans and the State of Louisiana which will be lasting.

DR. SAMUEL CLYDE FITTZ
(1880-1944)

The following is an extension of remarks of the Honorable A. Leonard Allen of Louisiana relative to the death of Dr. Fittz. It seems appropriate to publish in part these remarks:

"Mr. Speaker, one of the closest friendships I ever formed was with Dr. Samuel Clyde Fittz of my home town, Winnfield, La. In his death which occurred May 14, 1944, I have sustained the greatest loss of personal friendship. Dr. Fittz for more than a quarter of a century was my family physician. For a great many years we had adjoining offices. His sudden death has removed one of the most influential and useful citizens which my section of Louisiana has ever produced. Always sympathetic, always courteous, always ready to serve his fellow man, Dr. Fittz really gave his life for others. He worked in the heat, in the cold, in the night, and in the day, without sleep, without rest to minister to the needs of others."

DR. JAMES ARTHUR TUCKER

Whereas the Supreme Physician has seen fit to remove from our midst Dr. James Arthur Tucker, able physician, honorable man and loyal friend and,

Whereas in the passing of Dr. Tucker, we have

suffered an irreparable loss, and will miss the profound wisdom of his judgment, therefore be it

Resolved that this resolution of sorrow at his passing be incorporated into the records of the East Baton Rouge Parish Medical Society, a copy sent to the N. O. Medical and Surgical Journal, and a copy sent to his family.

East Baton Rouge Parish Medical Society
Lester J. Williams, M. O.
H. Guy Riche, M. D.
Tom Spec Jones, M. D.
Committee.

DR. WILLIAM I. HUNT

It is with deep sadness that we record the death of Captain William I. Hunt, M. C., who graduated from Tulane Medical School in 1942, served an internship at the Charity Hospital and then entered the Armed Services. Previously cited for bravery in action, Hunt was killed June 6, in the Southwest Pacific area.

A fine looking, serious, hard-working young man, Hunt's death will be a great shock to his many friends.

WOMAN'S AUXILIARY

MONTHLY REPORT OF THE WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY—JUNE, 1944

Although meetings of the Auxiliary are, of necessity, suspended for the summer months, the regular activities of the association are carried on by the officers and committees of the group.

Mrs. Rhodes Spedale, president, announces the names of the following officers, elected and installed at the annual meeting of the auxiliary held in New Orleans, April 25:

President-elect, Mrs. Paul G. Lacroix, 3132 State St., New Orleans; First Vice-President, Mrs. Arthur Long, 1367 Steele Drive, Baton Rouge; Second Vice-President, Mrs. Carroll Gelbke, 44 Willow Drive, Gretna; Third Vice-President, Mrs. O. B. Owens, 1931 Military Highway, Pineville; Fourth Vice-President, Mrs. B. C. Garrett, 4700 Fairfield, Shreveport; Treasurer, Mrs. R. D. Martinez, Plaquemine; Recording Secretary, Mrs. Frank Jones, 810 Park Blvd., Baton Rouge, and Corresponding Secretary, Mrs. E. C. Melton, Plaquemine.

Appointed as chairmen of standing committees are: Archives, Mrs. J. Kelly Stone, 72 Fontainebleau Drive, New Orleans; Bulletin, Mrs. R. T. Lucas, 535 Pierremont Road, Shreveport; Cancer Control, Mrs. Lloyd Kuhn, 4317 So. Miro St., New Orleans; Doctors' Day, Mrs. George Taquino, 18 Fontainebleau Drive, New Orleans; Finance, Mrs. M. C. Wiginton, Hammond; Hygeia, Mrs. De Witt Milam, 1704 Island Drive, Monroe; Indigent Widows, Mrs. Aynaud Hebert, 2013 Napoleon Ave., New Orleans; Legislation, Mrs. C. Grenes Cole, 4938 St. Charles Ave., New Orleans; Organization, Mrs. Phanor L. Perot, 1405 Park Ave., Monroe; Parliamentarian, Mrs. A. A. Herold, 1116 Louisiana Ave., Shreveport; Press and Publicity, Mrs. Edwin R. Guidry, 720 Broadway, New Orleans; Printing, Mrs. D. J. Murphy, 137 S. Solomon St., New Orleans; Program, Mrs. C. B. Erickson, 423 Herndon Ave., Shreveport; Public Relations, Mrs. J. E. Heard, 512 McCormick St., Shreveport; Red Cross, Mrs. C. M. Horton, Franklin; Revision of By-Laws, Mrs. Roy Carl Young, Covington; and War Participation, Mrs. S. L. Calhoun, 2241 Thornton Court, Alexandria.

To supervise group work as councilors for the year will be: First District, Mrs. H. T. Simon, 1300 Third St., New Orleans; Second District, Mrs. Roy B. Harrison, 2327 Napoleon Ave., New Orleans; Third District, Mrs. Guy Jones, Lockport; Fourth District, Mrs. T. E. Strain, 525 Wilder Place, Shreveport; Fifth District, Mrs. R. W. O'Donnell, 117 Stone Ave., Monroe; Sixth District, Mrs. Wiley A. Dial, 1137 Blvd., Baton Rouge; Seventh District, Mrs. Walter Moss, Drew Park Drive, Lake Charles; and Eighth District Mrs. A. L. Culpepper, 226 Bolton Ave., Alexandria.

Auxiliary members having business to conduct should get in touch with the individuals heading the groups as designated.

Respectfully submitted,
Mazie Adkins Guidry,
Chairman of Press and Publicity.

BOOK REVIEWS

Maurice Arthus' Philosophy of Scientific Investigation: Translated by Henry E. Sigerist with a foreword by Warfield T. Longcope. Baltimore, The Johns Hopkins Press, 1943. Pp. 26. Price, $0.75.

Maurice Arthus' brilliant work on anaphylaxis is known to all allergists. In the preface to "De l'anaphylaxie a l'immunite" published in 1921, he gives sound advice to the experamentalist in science. The preface is short, stimulating, and refreshing. It states clearly the necessary attributes for the scientific mind in doing problems of research. In a review it is only possible to mention some of the high spots in his discussion.

Conclusions drawn from scientific investigations are solid and lasting only if they are based on as complete as possible a study, accurately and minutely conducted. When generalizations are based on many cases, each should be based on careful study.

A theory is not a fact. There is a danger in holding to theories. A theory is a dogma, based

on faith, which may or may not be true. A theorist is a partisan and defends his ideas by all possible means. There is a tendency among young scientists to accept theories as facts. Theories are treacherous and seductive.

The proper method of scientific investigation is to conceive a hypothesis (a hypothesis is not a theory but merely a question), then ascertaining the value of this hypothesis experimentally, interpreting the experiments and then criticizing the interpretation vigorously and strictly.

An important thing is the possession of certain moral qualities, and scientific curiosity, which is not content with looking casually at certain facts and giving them any kind of interpretation. The fact must be studied and analyzed. The experimentalist must have a straight, clear, and precise mind.

If an observation has been made causing a series of hypotheses or questions, orienting research in various directions, the experimentalist will select only one, the one with the greatest promise. The others are discarded at least for the time. In this way the borderlines are established with precision, and he avoids being driven into sidelines which turn him away from the essential object of his research. Tenacity in determining the worth of a hypothesis is important. If examination and meditation on the subject of research does not help, stubborness should be avoided. The question may be merely kept in mind, and later the study may be reopened.

Facts and their interpretations and meanings may be held true and valid only when they have met the indispensable test of scientific criticism. This presupposes a special mental attitude, namely critical sense. The critical spirit, by the way, has nothing in common with the spirit of systematic opposition, or with the spirit of disparagement.

The experimentalist must have patience and self control. Practical applications may present themselves, but we should not be pulled away from our main investigation with the idea of coming to it again later.

Enthusiasts and careerists may lose the spirit of independence and the spirit of originality, and their scientific work may be dull and colorless. Independence and originality may be maintained by open discussion, mental reservations about things that are taught, and by criticism.

HENRY D. OGDEN, M. D.

Parasitic Diseases and American Participation in the War: By Horace W. Stunkard, Lowell T. Coggeshall, Thomas T. Mackie, Robert Matheson and Norman R. Stoll. New York Acad. of Sci., Vol. XLIV, Art. 3. Pp. 189-262. Sept. 30, 1943. Price, $1.00.

This is the series of papers presented before the Section of Biology, New York Academy of Sciences, on March 13, 1943, and contains in addition to an introduction by Professor Stunkard the current views of authorities in special fields of human parasitology, viz., protozoa (Coggeshall), helminths (Stoll), arthropods (Matheson) and clinical parasitology (Mackie). Brief discussions following the presentation of each paper are included. In addition to the interesting opinions expressed, there are several pages of solid facts and numerous bibliographic references.

ERNEST CARROLL FAUST, Ph. D.

Psychosomatic Disturbances in Relation to Personnel Selection: By Lawrence K. Frank, M. R. Harrower-Erickson, Lawrence S. Kubie, Gardner Murphy, Donal Sheehan, and Harold G. Wolff. New York Annals of the New York Academy of Sciences, Volume XLIV, Art. 6. Dec., 1943. Pp. 539-624. Price, $1.00.

This book is a timely one. The chapter by Mr. Frank is extremely stimulating and offers a vision of the future reorientation in education, particularly medical education. So far as psychologic disorders are concerned, the following chapters are each contributory toward a better appreciation of the selection of leaders and followers in any sort of group life, military or otherwise. Dr. Harrower-Erickson's chapter on the Rorschach brings out the very practical utility of this test in organic disorder. The chapter by Mr. Gardner Murphy is a comprehensive assay and synthesis on the use of psychological tests. The chapter by Dr. Kubie is an especially useful one and provocative of considerable thought and re-valuation of medical concepts. All in all, the book is interesting, informative, and well worth-while reading.

T. A. WATTERS, M. D.

Principles and Practice of Medicine, originally written by Sir William Osler, Bart., M. D., F. R. C. P., F. R. S.: By Henry A. Christian, A. M., M. D., LL. D., (How.) Sc. D., How. F. R. C. P. (Can.) 15th ed. New York, D. Appleton-Century Co., 1944. Pp. 1498. Price, $9.50.

When a book has achieved a fifteenth edition it became superfluous either to condemn or commend it to the profession. A book that has survived fifty years of cataclysmic cosmic change has placed itself beyond the reach of carping critics. It has become as much an integral part of American living as the ham sandwich and coke for luncheon. Generations of medical students have known no other guide than Osler so that enquiries as to other great teachers in American medicine would bring forth expressions of indecision and uncertainty. Since the days of Osler, the editors have

been Osler and McCrae, McCrae and now Christian, until we now have a new testament concerning the words of Osler according to McCrae and according to Christian. And this to me is hardly a Christian virtue. For by this time I doubt if anyone can tell which are the original thoughts and words of Osler, which the amendations of McCrae and which the medical distillate of the knowledge and wisdom of Christian. One wonders whether the name Osler is not employed as an "Open sesame" to prospective purchasers of new principles and practices for present-day physicians. But if Osler is retained as a tribute to an immortal in medicine it is both fitting and appropriate. It is a big book of over 1500 pages. The editor has succeeded admirably in bringing it up to date. Samplings from many parts of the book reveal most recent information concerning diagnosis and treatment. Briefly put, one can peruse its pages with the assumption that here is a volume to compare most favorably with the most reliable data in current literature. This is hardly surprising when one remembers that Christian sans Osler sans McCrae is one of the great contemporary American teachers. The tradition of Osler, well perpetuated, is admirably carried on in this new addition. There are some minor objections about the format of the book but we must remember messieurs, "c'est le guerre," pardonnez-moi.

I. L. ROBBINS, M. D.

Textbook of General Surgery: By Warren H. Cole and Robert Elman. New York, D. Appleton-Century Co., 1942. 4th ed. Pp. 1118.

I am certain that the ideal textbook of surgery has not been written but this "Textbook of General Surgery," fourth edition, comes near being one. The subject matter is presented as far as possible from the physiologic point of view. Pathogenesis has been emphasized in order that one may better perscribe the right therapy.

Great many advances have been made in surgery which made it necessary completely to reset the fourth edition. Chapters were revised and now ones added in order to present a systemic survey of the field of surgery.

The book together with current and other literature should be helpful to the undergraduate and graduate student.

REYNOLD PATZER, M. D.

Physical Foundations of Radiology: By Otto Glasser, Ph. D.; Edith H. Quimby, Sc. D.; Lauriston S. Taylor, Ph. D.; and J. L. Weatherwax, M. A. New York and London, Paul B. Hoeber, Inc. 1944. Pp. 426. Price, $5.00.

A volume of this title by any one of the four authors with such extensive experience in the teaching of radiologic physics would result in a valuable text. The collaboration of the group has produced an outstanding and an indispensable book. It is remarkable that so much material has been condensed into such a relatively small volume. The bibliography, however, adds considerable potential information.

The book is divided into nineteen chapters. The history, apparatus and fundamental principles of radiologic physics are considered in the first nine chapters. Measurements of x-ray quantity and quality and tissue dosage are included in Chapters X, XI and XII, respectively. The next four chapters deal with natural and artificial radioactive elements. The measurement of gamma ray quantity and the expression of radium dosage in gamma ray roentgens for the various types of application are timely and should aid materially in the universal adoption of this standard term for radium therapy. By the employment of the text and tables it is possible to convert the older expression of dosage in milligram-hours and millicurie-hours to gamma roentgens. The section on nuclear physics should serve as a background for a better understanding of this new form of radioactivity.

Chapter XVII is concerned with the relationship of biologic reaction to quality and intensity of radiation. In the Eighteenth Chapter, valuable suggestions are offered regarding roentgen-ray and radium therapy records. Roentgen-ray and radium protection is considered in the last chapter. The appendix containing roentgen-ray depth dose tables is a valuable addition to the work.

This book was written for physicians preparing to enter the field of radiology and for radiologists who desire a review for further information. It should serve as a necessary handbook to all radiotherapists.

J. N. ANÉ, M. D.

Manual of Human Protozoa: By Richard R. Kudo, D. Sc. Springfield, Ill., Charles C. Thomas, 1944. Pp. 125. 29 Figs. Price, $2.00.

This small octavo handbook provides at a glance the more important morphological and biological information concerning the parasitic protozoa of the digestive tract, those which develop in stale feces, those parasitic in the circulatory system and those in the muscles and reproductive organs. Special emphasis is placed on the species known to be pathogenic, viz., *Endamoeba histolytica, Balantidium coli, Trypanosoma gambiense, T. rhodesiense* and *T. cruzi, Leishmania donovani, L. tropica* and *L. brasiliensis*, the malaria parasites, *Isospora hominis* and *Sarcocystis lindemanni*.

Contrary to the unanimous recommendation of the International Commission on Zoological Nomenclature (Opinion No. 99, 1928) the author in-

sists on using "*Entamoeba*" for "*Endamoeba*". He also employs the older, more conservative spelling in such words as "diarrhoeic faeces" (p. 36). The zoologic information presented is both accurate and up to date. In diagnosis, however, no mention is made of the zinc sulphate centrifugal floatation for the concentration of protozoan cysts in a diagnosable stage from the feces, or of D'Antoni's iodine stain. Both of these technics, developed in recent years in the department of tropical medicine of Tulane University, have received wide recognition in public health and clinical laboratories in North America and Latin America. The little volume does not take up the clinical aspects of the infections produced by protozoa.

The format and typography are pleasing, typographical errors are very few and the illustrations are excellent, although some of them suffer from too great a reduction.

ERNEST CARROLL FAUST, Ph. D.

Applied Dietetics: By Frances Stern. Baltimore, Williams & Wilkins, 1943. Pp. 265. Price, $4.00.

On glancing over this well organized book on dietetics, one is struck by the large number of tables giving all sorts of information on food values. The sources of various minerals, vitamins, along with detailed description of bodily needs for these substances are here at the physician's fingertips.

There is an interesting section on the education of the patient in matters of diet. The author goes to great length to describe the needs of a normal individual and also presents sources of material for therapeutic diets.

This book is obviously one that should also prove to be of help to the laity, nurses, social workers, dieticians.

HENRY D. OGDEN, M. D.

PUBLICATIONS RECEIVED

W. B. Saunders Company, Philadelphia and London: Hydronephrosis and Pyelitis (Pyelonephritis) of Pregnancy, by H. E. Robertson, M. D.

Lea & Febiger, Philadelphia: Bacterial Infection, by J. L. T. Appleton, B. S., D. D. S., Sc. D.

J. B. Lippincott Company, Philadelphia and London: Principles and Practices of Inhalational Therapy, by Alvan L. Barach, M. D.

Paul B. Hoeber, Inc., New York and London: Infections of the Peritoneum, by Bernhard Steinberg, M. D. Physical Medicine in General Practice, by William Bierman, M. D.

Charles C. Thomas, Springfield, Illinois and Baltimore, Maryland: Psychiatry and the War, edited by Frank J. Sladen, M. D.

The Williams & Wilkins Company, Baltimore, Maryland: Radiation and Climatic Therapy of Chronic Pulmonary Diseases, edited by Edgar Mayer, F. A. C. P., F. A. C. C. P.

Columbia University Press, New York: One Hundred Years of American Psychiatry, published for the American Psychiatric Association.

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